

1988

A Distributional Analysis of the Warblers of the West Indies. (Volumes I and II).

David Neal Pashley

Louisiana State University and Agricultural & Mechanical College

Follow this and additional works at: https://digitalcommons.lsu.edu/gradschool_disstheses

Recommended Citation

Pashley, David Neal, "A Distributional Analysis of the Warblers of the West Indies. (Volumes I and II)." (1988). *LSU Historical Dissertations and Theses*. 4665.

https://digitalcommons.lsu.edu/gradschool_disstheses/4665

This Dissertation is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Historical Dissertations and Theses by an authorized administrator of LSU Digital Commons. For more information, please contact gradetd@lsu.edu.

INFORMATION TO USERS

The most advanced technology has been used to photograph and reproduce this manuscript from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book. These are also available as one exposure on a standard 35mm slide or as a 17" x 23" black and white photographic print for an additional charge.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

U·M·I

University Microfilms International
A Bell & Howell Information Company
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
313/761-4700 800/521-0600

Order Number 8917844

**A distributional analysis of the warblers of the West Indies.
(Volumes I and II)**

Pashley, David Neal, Ph.D.

The Louisiana State University and Agricultural and Mechanical Col., 1988

U·M·I

**300 N. Zeeb Rd.
Ann Arbor, MI 48106**

A DISTRIBUTIONAL ANALYSIS OF THE
WARBLERS OF THE WEST INDIES

Volume 1

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Forestry, Wildlife, and Fisheries

by
David Neal Pashley
B.S., Humboldt State University, 1974
December 1988

ACKNOWLEDGMENTS

Robert B. Hamilton, Dorothy P. Pashley, and J. V. Remsen, Jr., have provided support and welcomed suggestions throughout the often grueling development of this project and preparation of this manuscript. R. C. Banks, A. R. Lewis, and anonymous reviewers have suggested changes in the first two chapters that have had a large impact on the structure of the dissertation. Improvements in specific chapters has resulted from assistance from H. A. Raffaele (Virgin Islands), N. K. Klein (Lesser Antilles), and D. B. Wingate (Bermuda). I thank P. Y. Burns, R. H. Chabreck, and F. M. Truesdale for serving as committee members. As a student in the School of Forestry, Wildlife, and Fisheries, I have appreciated the friendship and lonely beacons of reason supplied by W. C. Barrow, R. P. Martin, and F. J. Vilella.

The professional and courteous assistance I have received from curators, collections managers, and other museum staff members has expedited and often made pleasant the accumulation of the data that make up the bulk of this dissertation. I include here a list of the museums whose names appear most frequently in this dissertation, the abbreviations frequently used, and the staff members to whom I owe a debt of gratitude.

American Museum of Natural History (AMNH) - R. W. Dickerman
and M. K. LeCroy;

Academy of Natural Sciences of Philadelphia (ANSP) - M. B.
Robbins;

Bell Museum of Natural History (University of Minnesota) -
D. W. Warner;

British Museum (Natural History) (BMNH) - A. Knox;

Carnegie Museum of Natural History (CM) - K. C. Parkes and
D. S. Wood;

Cornell University - R. G. Bauer;

Delaware Natural History Museum (DNHM) - D. M. Niles and E.
Hess;

Denver Museum of Natural History - C. A. Chase III;

Field Museum of Natural History (FM) - S. M. Lanyon and D.
E. Willard;

Florida Museum of Natural History (UF) - T. A. Webber;

Louisiana State University Museum of Zoology (LSU) - J. V.
Remsen, Jr., and S. W. Cardiff;

Museum of Comparative Zoology, Harvard (MCZ) - R. A.
Paynter, Jr.;

Museo Nacional de Historia Natural, Santo Domingo (MNHN) -
J. A. Ottenwalder and A. Espinal;

Museum of Vertebrate Zoology, University of California at
Berkeley (MVZ) - A. Jacobberger;

Natural History Museum of Los Angeles County - K. L.
Garrett;

Peabody Museum, Yale University (PM) - F. C. Sibley;

Royal Ontario Museum (ROM) - B. Millen;
University of Kansas (from which I also received data from
Southwestern College) - R. F. Johnston;
University of Michigan Museum of Zoology (UMMZ) - R. W.
Storer;
University of Puerto Rico Mayaguez (UPRM) - A. R. Lewis;
United States National Museum (USNM) - R. L. Zusi and J. P.
Angle; and
Zoologische Museum Amsterdam (ZMA) - T. G. Prins and J.
Wattel.

The staffs of the Louisiana State University Hill
Memorial Library and Interlibrary Loan Office have also been
extremely helpful. Finally, I thank the Louisiana State
University Alumni Federation and the Frank M. Chapman
Memorial Fund for financial assistance.

TABLE OF CONTENTS

	Page
Volume 1	
ACKNOWLEDGMENTS	ii
TABLE OF CONTENTS	v
LIST OF TABLES	vi
LIST OF FIGURES	xi
ABSTRACT	xii
INTRODUCTION	1
WARBLERS OF THE WEST INDIES	
I. THE VIRGIN ISLANDS	14
II. THE WESTERN CARIBBEAN	48
III. THE LESSER ANTILLES	91
IV. THE BAHAMA ISLANDS	167
V. BERMUDA	284
VI. PUERTO RICO AND ADJACENT ISLANDS	309
Volume 2	
VII. JAMAICA	376
VIII. HISPANIOLA	426
IX. CUBA	497
X. A DISTRIBUTIONAL ANALYSIS OF THE WARBLERS OF THE WEST INDIES.	
SUMMARY AND DISCUSSION	577
VITA	679

LIST OF TABLES

Chapter Table		Page
Intro	1. Numbers of wood-warbler specimens and species from south of the United States from each museum collection.	10
I.	1. Evidence for the occurrence of warblers in the Virgin Islands.	17
	2. Christmas Bird Count results from St. Croix, St. Thomas, and St. John.	19
II.	1. Evidence for the occurrence of warblers on the islands of the Western Caribbean.	51
	2. The number of warbler species reported for each island or island group and the type of evidence supporting each report.	82
III.	1. The most common migrant species in the Lesser Antilles in terms of (1) the number of islands from which they have been reported, (2) the number of islands from which specimens (that I have located) exist, and (3) the total number of specimens.	144
	2. The warbler avifauna of each of the Lesser Antilles.	147
VI.	1. Evidence for listing of migrant warblers in the avifaunas of Puerto Rico and adjacent islands.	365
X.	1. The numbers of specimens of permanent resident warblers from each month from each region of the West Indies.	582
	2. Waller-Duncan K-ratio T test for mean numbers of specimens of resident warblers by month.	585
	3. Waller-Duncan K-ratio T test for mean numbers of specimens of each of the 13 common migrant warbler species by month.	586
	4. Evidence for the occurrence of <u>Dendroica pinus</u> in the West Indies (migrants only)	592

5.	Evidence for the occurrence of <u>Dendroica townsendi</u> in the West Indies.	593
6.	Evidence for the occurrence of <u>Vermivora celata</u> in the West Indies.	596
7.	Evidence for the occurrence of <u>Vermivora ruficapilla</u> in the West Indies.	597
8.	Evidence for the occurrence of <u>Icteria virens</u> in the West Indies.	598
9.	Evidence for the occurrence of <u>Wilsonia pusilla</u> in the West Indies.	599
10.	Evidence for the occurrence of <u>Dendroica petechia</u> in the West Indies.	600
11.	Evidence for the occurrence of <u>Oporornis philadelphia</u> in the West Indies.	604
12.	Evidence for the occurrence of <u>Wilsonia canadensis</u> in the West Indies.	605
13.	Evidence for the occurrence of <u>Vermivora peregrina</u> in the West Indies.	606
14.	Evidence for the occurrence of <u>Dendroica pensylvanica</u> in the West Indies.	607
15.	Evidence for the occurrence of <u>Dendroica fusca</u> in the West Indies.	608
16.	Evidence for the occurrence of <u>Dendroica castanea</u> in the West Indies.	609
17.	Evidence for the occurrence of <u>Dendroica cerulea</u> in the West Indies.	610
18.	Evidence for the occurrence of <u>Dendroica striata</u> in the West Indies.	612

19.	Evidence for the occurrence of <u>Oporornis agilis</u> in the West Indies.	613
20.	Evidence for the occurrence of <u>Vermivora chrysoptera</u> in the West Indies.	615
21.	Evidence for the occurrence of <u>Protonotaria citrea</u> in the West Indies.	616
22.	Evidence for the occurrence of <u>Oporornis formosus</u> in the West Indies.	617
23.	Evidence for the occurrence of <u>Vermivora pinus</u> in the West Indies.	618
24.	Evidence for the occurrence of <u>Dendroica magnolia</u> in the West Indies.	619
25.	Evidence for the occurrence of <u>Dendroica virens</u> in the West Indies.	620
26.	Evidence for the occurrence of <u>Wilsonia citrina</u> in the West Indies.	621
27.	Evidence for the occurrence of <u>Helmitheros vermivorus</u> in the West Indies.	623
28.	Evidence for the occurrence of <u>Limnithlypis swainsonii</u> in the West Indies.	624
29.	Evidence for the occurrence of <u>Vermivora bachmanii</u> in the West Indies.	626
30.	Evidence for the occurrence of <u>Dendroica kirtlandii</u> in the West Indies.	627
31.	Evidence for the occurrence of <u>Dendroica coronata</u> in the West Indies.	629
32.	Evidence for the occurrence of <u>Mniotilta varia</u> in the West Indies.	630
33.	Evidence for the occurrence of <u>Setophaga ruticilla</u> in the West Indies.	631

34.	Evidence for the occurrence of <u>Seiurus aurocapillus</u> in the West Indies.	632
35.	Evidence for the occurrence of <u>Seiurus noveboracensis</u> in the West Indies.	633
36.	Evidence for the occurrence of <u>Seiurus motacilla</u> in the West Indies.	634
37.	Evidence for the occurrence of <u>Geothlypis trichas</u> in the West Indies.	635
38.	Evidence for the occurrence of <u>Parula americana</u> in the West Indies.	637
39.	Evidence for the occurrence of <u>Dendroica tigrina</u> in the West Indies.	638
40.	Evidence for the occurrence of <u>Dendroica caerulescens</u> in the West Indies.	639
41.	Evidence for the occurrence of <u>Dendroica dominica</u> in the West Indies.	640
42.	Evidence for the occurrence of <u>Dendroica discolor</u> in the West Indies.	641
43.	Evidence for the occurrence of <u>Dendroica palmarum</u> in the West Indies.	642
44.	The numbers and percentages of total number of specimens of the 13 common wintering West Indian warblers and the areas and percentages of total area from each region of the West Indies.	644
45.	Numbers of specimens of each common migrant warbler from each region, the percentage of specimens of that species from that region, and the rank in abundance among these 13 species in each region.	647
46.	The most common species in terms of numbers of specimens from each West Indian region.	653

47. Total number of specimens, average specimen date, and standard deviation among specimen dates for the 13 common West Indian wintering warblers. 661
48. The number of individuals observed per search hour in three habitat types in the Tuxtla region of southern Veracruz, Mexico. 663
49. Percentages of West Indian specimens for migrant species for which this value > 10%, overall ranked abundances among the 38 West Indian warblers, and degree of habitat specialization. 675

LIST OF FIGURES

Chapter	Figure		Page
Intro	1.	Map of the West Indies	5
I.	1.	Map of the Virgin Islands, including all islands in text.	15
II.	1.	Map of the Western Caribbean, including all islands considered in the text.	49
III.	1.	Map of the Lesser Antilles, including all islands mentioned in the text.	92
X.	1.	Temporal distribution of warblers in the West Indies.	588
	2.	UPGMA tree of similarities among regions based upon wintering warbler avifaunas.	655
	3.	Degree of similarity among regions based upon Rogers distances from Figure 2.	657
	4.	UPGMA tree of similarities among West Indian wintering warblers based upon regional distribution.	659

ABSTRACT

Wood-warblers (Aves:Emberizidae:Parulinae) are a conspicuous and perhaps declining component of the avifauna of North America and the Neotropics. The West Indies are home to 16 permanent resident species and have been included in the ranges of 40 migrant species. On the basis of specimens in the world's museums and published literature, I report the known status, seasonality, and natural history of warblers in the Virgin Islands (1 permanent resident; 29 migrants), the Western Caribbean (2;28), the Lesser Antilles (5;26), the Bahamas (5;38), Bermuda (0;38), Puerto Rico (3;30), Jamaica (2;32), Hispaniola (4;31), and Cuba (4;35). I grouped the migrants into nine categories: 1) two species are strictly accidental, 2) five are accidental but not entirely unusual, 3) seven winter and generally migrate on the mainland but appear infrequently in the West Indies, 4) two winter in South America but migrate exclusively through the West Indies, 5) seven are typically mainland birds that are regular in small numbers in the West Indies, 6) two are uncommon species for which the West Indies constitute important winter range, 7) two are rare species that winter exclusively in the region, 8) seven winter commonly both in the West Indies and the Neotropical mainland, and 9) six are common and largely or exclusively West Indian in winter.

Within groups, there is variation in distribution, seasonality, and habitats and resources utilized. Because each species is unique, management recommendations cannot be applied to the group as a whole. Most migrant species use generalized and often disturbed habitats and are not necessarily suffering from widespread human-induced habitat degradation. Resident warblers, including nine species, subspecies, or populations that are potentially threatened, tend to require undisturbed habitat. Management should concern maintenance or enhancement of habitat for these populations.

INTRODUCTION

In 1859 John Matthew Jones wrote that "the migration of birds in the western hemisphere is a subject of enquiry concerning which little progress has yet been made, and which for many years to come will require the close observations of naturalists to compass its vast extent." Terborgh (1980) implied that there still had been little progress made by stating that "in spite of our intense preoccupation with their [i.e., migrant land birds] goings and comings, it was not until comparatively recently that we took more than a casual notice of where all the birds go and what they do there." To date there remains no rigorous examination of the winter distribution of migratory land birds.

Notices of wood-warblers (Emberizidae:Parulinae) include works by Cooke (1904) and Bent (1953); these authors summarized information from available literature on the birds' winter distributions. Gochfeld (1979) presented a table of the Neotropical status of eastern North American warblers on the basis of information in a few popular field guides. Although the local status of migrants has been itemized in regional avifaunas or field guides in a few scattered areas in the Neotropics, there have been no other efforts to summarize the specifics of warbler winter biogeography. Hellmayr (1935), Lowery and Monroe (1968), and the American Ornithologists' Union (1983) have broadly

delimited winter ranges. Rappole et al. (1983) presented vague maps and tables summarizing some of the literature concerning all Nearctic migrants. The limited winter distribution of one rare warbler, Kirtland's Warbler (Dendroica kirtlandii), has been examined in detail (Van Tyne 1951, Mayfield 1960, Radabaugh 1974). The distribution of no other species of warbler has been studied in detail.

Terborgh (1980) stated "that continued deforestation in the near neotropics will result in major reductions in the numbers of many forest-dwelling migrants. We are, in effect, about to play observers in a massive experiment in which there will be dramatic alterations in the relative population sizes of numerous common species." Meanwhile, observers on these birds' breeding grounds reported population declines that they postulated were due to habitat changes on the breeding grounds, the wintering grounds, or both (e.g., Wilcove and Whitcomb 1983, Hall 1984, Wilcove and Terborgh 1984).

In short, there has been a recognition of the ornithological community's ignorance concerning the winter biology of migratory birds, notably warblers, and an increasing fear that populations of these species were threatened with population reductions and perhaps extinction (summarized by Rappole et al. 1983). This is the milieu in which I conceived my dissertation research. I recognized that the first project that needed to be completed was a precise description of warbler winter ranges. Once these

ranges are known, additional questions can be addressed. The habitats used or preferred by each species (and geographic variation in use or preference) need to be identified. The status, in terms of rate of degradation, of critical habitats for each species over its range needs to be established. This combination of data would: a) form a backdrop against which future changes could be effectively evaluated; b) allow conservation efforts to be focused where they could do the most good; and c) serve as baseline data for answering ecological and evolutionary questions concerning migrant birds and their relations with each other and with permanent residents.

There is a tremendous source of information concerning these warblers in the museum collections of the world. Thousands of specimens collected over the past century and a half are distributed in dozens of collections. The existence of the vast majority of these specimens has not been recognized in the literature. Museum curators are generally barely able to keep up with day-to-day curatorial responsibilities, and the chance that advanced computing and communication systems would allow an international inventory of all specimens and literature in the foreseeable future is small. It is necessary to examine all relevant specimens in these collections in order to obtain an accurate picture of the distribution of warblers in the Neotropics. To my knowledge, such an extensive survey had never been undertaken for as large a group as the wood-warblers.

I have accumulated complete distribution data on all of these warbler species and habitat data on quite a few, but the quantity of information is too large to be included in a single dissertation. I decided, therefore, to concentrate on the warblers in the West Indies (fig. 1). I chose this region for several reasons: (1) 93% of all bird species and subspecies that have gone extinct since 1600 have been island inhabitants and about half of the world's currently threatened species are restricted to islands (Johnson 1988); (2) a number of permanent resident West Indian warbler species and subspecies are severely threatened; (3) of all of the eastern North American breeding migrant warblers, the three rarest either winter (Vermivora bachmanii and Dendroica kirtlandii) or migrate exclusively through (Oporornis agilis) the West Indies; and (4) except for Cuba, I felt confident that I have sufficient (or even complete) information for this region. Data on areas outside the West Indies will be published over the next several years.

There are 112 currently recognized species of wood-warblers (family Emberizidae; sub-family Parulinae) (Lowery and Monroe 1968). Except for records of vagrant individuals, the sub-family is limited in distribution to the Western Hemisphere. My data base encompassed the 89 species that wholly or partially breed north of South



Figure 1. Map of the West Indies.

America (as delimited by the Panama-Colombia border and the southern coast of Trinidad). The breeding ranges of 24 of warbler species are limited to Middle America and Trinidad; they extend in some cases into South America but never regularly into the United States. These species will not be treated here. The 16 species that are permanent breeding residents of the West Indies are the first focus of this dissertation (three of these also breed on the North American mainland). Fifty-two species breed partly or wholly in the United States and/or Canada. The 40 of these reported from the West Indies are the second focus of this dissertation.

I use the term West Indies rather than Caribbean because I included islands not strictly in the Caribbean Sea. The first nine chapters of the dissertation deal with the West Indies on a regional basis. There are chapters on the Virgin Islands, the Western Caribbean, the Lesser Antilles, the Bahamas (including the Turks and Caicos), Bermuda, Puerto Rico, Jamaica, Hispaniola, and Cuba. Several areas that might logically have been included have been omitted. First, I excluded islands within the boundaries of the United States. I also excluded those islands that have strong continental influences (e.g., Cozumel, Trinidad). All of these excluded islands are on migratory routes and are used in winter by a number of warbler species. Eventually these islands, and more critically the continental landmass, must be fully evaluated

before an overview of warbler distribution in the Neotropics can be completed.

I have accumulated data concerning all Neotropical warbler specimens in 39 museum collections. I began cataloguing bird specimen data at the Louisiana State University Museum of Zoology early in 1985. In summer 1985, I examined the bird collections at the University of Arizona in Tucson, the University of California at Los Angeles, the Natural History Museum of Los Angeles County, the Western Foundation for Vertebrate Zoology, the Moore Collection at Occidental College, the California Academy of Science, the Museum of Vertebrate Zoology at the University of California at Berkeley, the Denver Museum of Natural History, and Texas A&M University. In February 1986 I examined the collections of the Instituto de Biologia and the Facultad de Ciencias of the Universidad Nacional Autonoma de Mexico in Mexico City. In summer 1986 I travelled to the Carnegie Museum of Natural History, the United States National Museum, the Delaware Museum of Natural History, the American Museum of Natural History, the Peabody Museum at Yale University, the Museum of Comparative Zoology at Harvard University, Cornell University, the University of Michigan Museum of Zoology, the Field Museum of Natural History, and the Bell Museum at the University of Minnesota. In April 1988 I visited the British Museum (Natural History), subdepartment of Ornithology, at Tring, and in May 1988 I examined the birds at the University of Puerto Rico, Mayaguez. There are 15

collections that I have not personally visited but for which other individuals have provided the pertinent data.

Alphabetically by institution, the people whom I have relied upon for information from these 15 collections are Mark Robbins, Academy of Natural Sciences of Philadelphia; David Wingate, Bermuda Aquarium, Natural History Museum and Zoo; Chris Wood, Burke Museum, University of Washington; Tom Webber, Florida Natural History Museum; Mario Ramos and Judith Vega Morales, INIREB, San Cristobal de las Casas, Chiapas, Mexico; Jose Ottenwalder and Angelica Espinal, Museo Nacional de Historia Natural in Santo Domingo, Dominican Republic; Amadeo Rea, Natural History Museum of San Diego; Brad Millen, Royal Ontario Museum; Steve Cardiff and Eugene Cardiff at the San Bernadino County Museum of Natural History; Richard Johnston and Tristan Davis, University of Kansas (who also supplied data from Southwestern College and Ft. Hays State University in Kansas and the University of Nebraska); Gary Schnell, University of Oklahoma; and Tineke Prins, Zoologisch Museum Amsterdam. The numbers of pertinent warbler specimens and species in each collection are listed in Table 1.

I have not acquired information from other museums and collections that doubtlessly house specimens relevant to these investigations. Collections in Stockholm, Paris, and Berlin hold specimens of historical interest. There are collections within the range of my study, notably in Cuba, in which specimens critical for further analysis need to be

examined. I hope someday to visit these collections. Nevertheless, I believe I have pertinent information on greater than 95% of the world's extant specimens from this region.

The format of this document is the result of my own inclinations and well as those of committee members and reviewers and the editor of the Caribbean Journal of Science. The overriding concern has been to maximize simultaneously clarity and brevity. I have adopted a "telegraphic" style of presentation within species accounts that allows consistency while minimizing repetition. Abbreviations of museums and of certain frequently used words (spec[s]. for specimen[s], ind[s]. for individual[s]) are used throughout. Specific abbreviations are indicated within each chapter. For the sake of readers interested in one area but not necessarily the entire region, the literature cited has been presented along with each chapter rather than united at the end.

Table 1. Numbers of wood-warbler specimens and species from south of the United States from each museum collection.

Museum	Specimens	Species
United States National Museum (USNM)	5685	87
American Museum of Natural History (AMNH)	5411	85
Museum of Comparative Zoology (Harvard) (MCZ)	4849	82
British Museum (Natural History) (BMNH)	4364	82
Moore Collection (Occidental)	4023	55
Field Museum of Natural History (FM)	3954	85
Louisiana St. Univ. Museum of Zoology (LSU)	3379	85
Delaware Natural History Museum (DNHM)	2046	69
Bell Museum (Univ. of Minnesota)	1925	57
Carnegie Museum of Natural History (CM)	1832	78
Univ. of Michigan Museum of Zoology (UMMZ)	1374	76
Museum of Vertebrate Zoology, Berkeley (MVZ)	1352	57
INIREB (Chiapas)	1064	36
Royal Ontario Museum (ROM)	1033	66
Western Foundation for Vertebrate Zoology	963	58
UNAM (Instituto de Biologia)	934	44
California Academy of Science	868	53
Univ. California at Los Angeles	844	56
Academy of Nat. Sci. of Philadelphia (ANSP)	822	73

Table 1 (continued)

Museum	Specimens	Species
Peabody Museum (Yale) (PM)	727	71
Cornell University	518	68
Nat. Hist. Museum of Los Angeles County	415	55
Univ. of Kansas	377	48
UNAM (Facultad de Ciencias)	298	36
Zoologisch Museum Amsterdam (ZMA)	275	30
Texas A&M Univ.	221	36
San Diego Natural History Museum	217	15
Univ. of Arizona	184	34
Florida Museum of Natural History (UF)	162	45
Southwestern College (Kansas) (SWK)	169	42
Univ. of Oklahoma	135	25
Univ. of Puerto Rico, Mayaguez (UPRM)	122	18
Museo Nac. Hist. Nat., Santo Domingo (MNHN)	101	22
Denver Natural History Museum	59	21
Fort Hays State (Kansas)	31	12
Bermuda Aquarium, Museum, Zoo (BAMZ)	26	15
Washington State Museum	13	5
Univ. of Nebraska	11	8
San Bernadino Natural History Museum	7	3

LITERATURE CITED

- American Ornithologists' Union. 1983. Check-list of North American birds. 6th ed. American Ornithologists' Union, Washington, D.C. 877 p.
- Bent, A. C. 1953. Life histories of North American wood warblers. Bull. U.S. Nat. Mus. 203:1-734.
- Cooke, W. W. 1904. Distribution and migration of North American warblers. U.S.D.A. Div. Biol. Serv. Bull. 18. U.S. Dept. Agric., Washington, D.C. 142 p.
- Gochfeld, M. 1979. Wintering ranges of migrant warblers of eastern North America. Amer. Birds 33:742-745.
- Hall, G. A. 1984. Population decline of neotropical migrants in an Appalachian forest. Amer. Birds 38:14-18.
- Hellmayr, C. E. 1935. Catalogue of birds of the Americas and adjacent islands. Field Mus. Nat. Hist., Zool. Ser. 13: Part 8:1-541.
- Johnson, T. H. 1988. Biodiversity and conservation in the Caribbean. Internat. Council for Bird Preservation Monogr. No. 1. Cambridge, U.K. 144 p.
- Jones, J. M. 1859. The naturalist in Bermuda: a sketch of the geology, zoology, and botany, of that remarkable group of islands; together with meteorological observations. Reeves & Turner, London. 200 p.
- Lowery, G. H., Jr., and B. L. Monroe, Jr. 1968. Family Parulidae. P. 3-93 in R. A. Paynter, ed., Check-list of
-

- birds of the world, vol. 14. Harvard Univ. Press, Cambridge, Mass.
- Mayfield, H. 1960. The Kirtland's Warbler. Cranbrook Inst. of Sci., Bloomfield Hills, Mich. 242 p.
- Radabaugh, B. E. 1974. Kirtland's Warbler and its Bahama wintering grounds. Wilson Bull. 86:374-383.
- Rappole, J. H., E. S. Morton, T. E. Lovejoy, III, and J. L. Ruos. 1983. Nearctic avian migrants in the Neotropics. U.S. Fish & Wildl. Serv., Washington, D.C. 645 p.
- Terborgh, J. W. 1980. The conservation status of Neotropical migrants: present and future. P. 21-30 in A. Keast and E. S. Morton, eds., Migrant birds in the Neotropics: ecology, behavior, distribution, and conservation. Smithsonian Inst. Press, Washington, D.C.
- Van Tyne, J. 1951. The distribution of the Kirtland Warbler (Dendroica kirtlandii). Proc. X Internat. Ornithol. Cong.:537-544.
- Wilcove, D. S. and J. W. Terborgh. 1984. Patterns of population decline in birds. Amer. Birds 38:10-13.
- Wilcove, D. S. and R. F. Whitcomb. 1983. Gone with the trees. Nat. Hist. 92:82-91.

WARBLERS OF THE WEST INDIES

I. THE VIRGIN ISLANDS

Information concerning the distribution and biology of warblers in the Neotropics has never been summarized in a satisfactory manner. This paper is the first in a series addressing this oversight. The islands of the United States and British Virgin Islands form a reasonably well-defined geographical unit at the eastern terminus of the Greater Antilles, separated by the broad Anegada Passage from the northwesternmost of the Lesser Antilles (Fig. 1). Although only one species of warbler breeds in the Virgin Islands, many wintering and transient migrant species have been recorded there.

Ridgway (1902) listed those publications that had referred to the presence of each warbler species in the Virgin Islands, generally without note as to what information previous authors had included. That list was updated by Wetmore (1927) and Hellmayr (1935). Although Wetmore (1927) relied heavily on specimens in the United States National Museum (USNM), and Hellmayr (1935) on those in the Field Museum of Natural History (FM) collection, many warbler specimens from the Virgin Islands housed in other collections or those acquired more recently by the USNM or FM have not been noted in the literature. Authors of more recent field guides and/or avifaunal lists for the Virgin

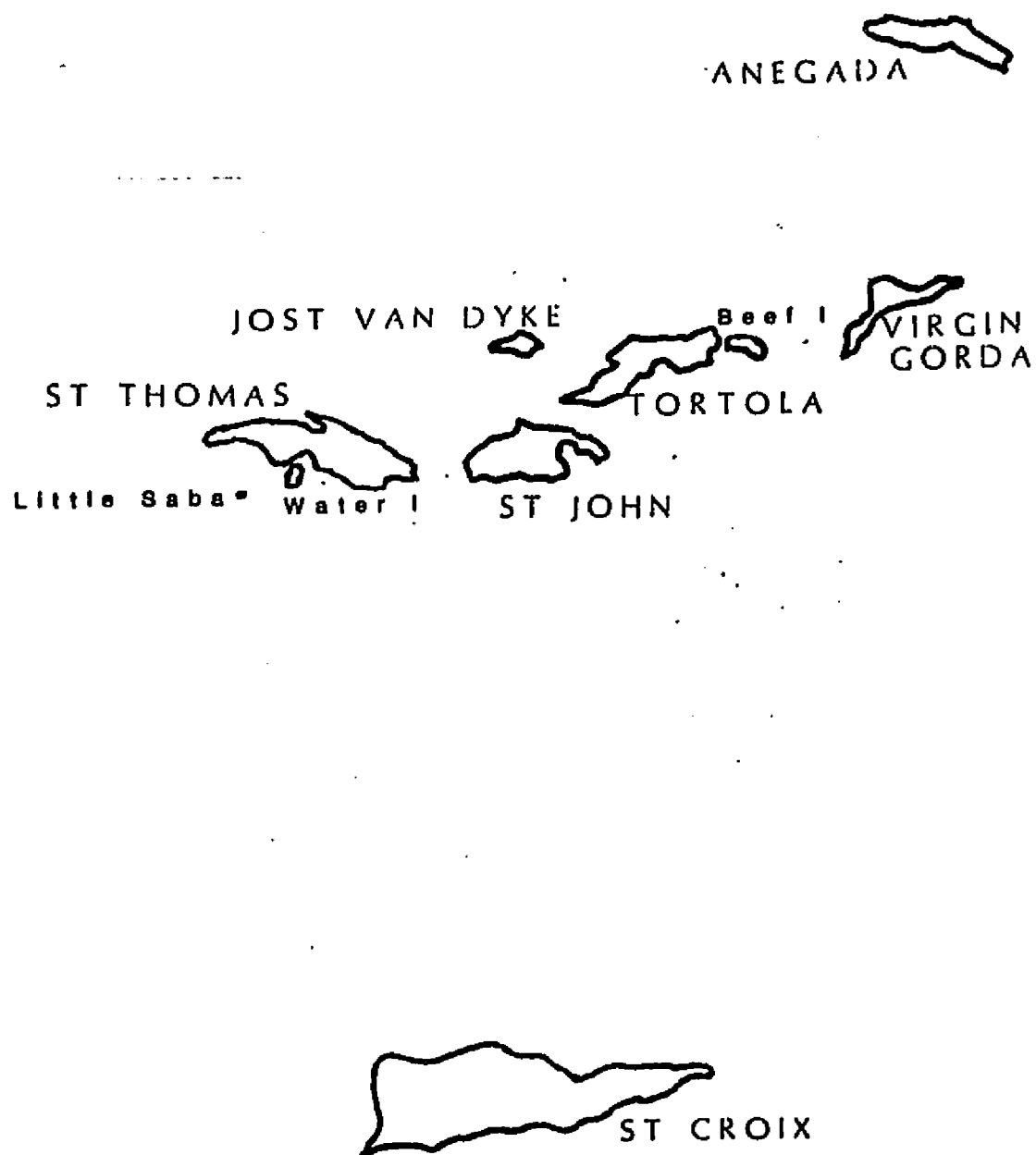


Figure 1. Map of the Virgin Islands, including all islands considered in the text.

Islands (Leopold 1963, Philibosian and Yntema 1977, Raffaele 1983, Sladen 1987) have incorporated some of the available literature and specimen data, but generally without reference to sources or dates.

I document the occurrence of each species reported in the Virgin Islands (summarized in Table 1). Documentation is based upon my examination of the specimens in 39 of the largest museum collections in the world. These data are supplemented by information in the literature. Although I have included published sight reports, these are, in general, less reliable than specimens or photographs.

For several reasons, seasonal and abundance status assignments would be inconsistent for the Virgin Islands. The United States Virgin Islands (St. Croix, St. Thomas, St. John, and outlying islands) are better known ornithologically than are the British Virgin Islands (Jost van Dyke, Tortola, Virgin Gorda, Anegada, and outlying islands). Efforts to collect data evenly from all months of the year have not been made. Also, the dates on which any particular species migrates are poorly differentiated from those dates on which that species would be on its wintering ground.

Data on warblers reported in Virgin Island Christmas Bird Counts (CBC's) are noted in the text and are summarized in Table 2. CBC results are a unique and potentially valuable source of information on bird densities and on

Table 1. Evidence for the occurrence of warblers in the Virgin Islands.¹

	U.S. ²			BRIT. ²			
	SC	ST	SJ	JD	TO	VG	AN
<i>Vermivora pinus</i>	r	r	r	-	-	-	-
<i>V. chrysoptera</i>	-	-	r	-	-	-	-
<i>V. peregrina</i>	-	-	p	-	-	-	-
<i>Parula americana</i>	8	7	r	r	3	2	r
<i>Dendroica petechia</i>	29	25	5	r	8	22	25
<i>D. pensylvanica</i>	-	-	r	-	-	-	-
<i>D. magnolia</i>	r	r	r	-	-	-	-
<i>D. tigrina</i>	9	1	?	-	r	-	-
<i>D. caerulescens</i>	2	1	r	-	-	-	r
<i>D. coronata</i>	2	1	r	-	-	r	-
<i>D. virens</i>	3	r	r	-	-	-	-
<i>D. fusca</i>	-	-	r	-	-	-	-
<i>D. dominica</i>	r	r	r	-	-	-	-
<i>D. discolor</i>	8	3	1	-	3	9	2
<i>D. palmarum</i>	1	?	r	-	r	-	-
<i>D. castanea</i>	2	-	-	-	-	-	-
<i>D. striata</i>	4	r	r	-	-	-	-
<i>Mniotilta varia</i>	8	2	r	-	-	-	-
<i>Setophaga ruticilla</i>	8	5	?	-	2	2	-
<i>Protonotaria citrea</i>	1	r	r	-	-	-	-
<i>Helmitheros vermivorus</i>	3	-	r	-	-	-	-
<i>Limnithlypis swainsonii</i>	-	-	r	-	-	-	-
<i>Seiurus aurocapillus</i>	4	2	r	-	r	-	r
<i>S. noveboracensis</i>	10	3	1	r	6	r	r
<i>S. motacilla</i>	3	1	r	r	-	-	-
<i>Oporornis formosus</i>	-	r	r	-	-	-	-
<i>O. agilis</i>	-	-	r	-	-	-	-
<i>Geothlypis trichas</i>	1	r	r	-	r	-	r
<i>Wilsonia citrina</i>	3	r	r	-	-	-	-
<i>W. canadensis</i>	?	r	-	-	-	-	-

¹Numbers are the numbers of specimens that I have located; ? indicates that specimens that I have not located have been mentioned in the literature; p is based upon photographic evidence; r indicates that inclusion in the list is based upon sight reports.

²SC - St. Croix, ST - St. Thomas, SJ - St. John, JD - Jost van Dyke, TO - Tortola & Beef Island, VG - Virgin Gorda, AN - Anegada.

local avifaunas. Even though claims for the rarer species and for those difficult to identify must be treated with caution, the CBC results are, in some ways, superior to other sources of information. CBC's can be used to compare abundances among islands (although there is variability among observers in different counts), and also, within a count, to give a rough idea of relative abundances among species. Differences among species that could hamper the latter comparison may not be a problem because most warblers on wintering grounds are relatively similar in detectability.

There have been 14 CBC's held on St. Croix through the 1985-86 count period, with participants expending a total of 216.5 party hours. The 10 counts on St. Thomas have totaled 135.5 party hours and 9 St. John counts total 364. Raw data from these counts were published in the fourth number of each volume of American Birds from 1973 through 1986.

Throughout this document, Latin names, common names, and sequence follow the American Ornithologists' Union checklist (1983).

Table 2. Christmas Bird Count results from St. Croix, St. Thomas, and St. John;¹

	St.Croix counts ph		St.Thomas counts ph		St.John counts ph	
Vermivora pinus			1	P	2	P
V. chrysoptera					1	P
Parula americana	14	0.55	10	1.50	8	1.97
Dendroica petechia	14	1.72	9	0.52	9	0.54
D. pensylvanica					1	P
D. magnolia			1	P	5	0.03
D. tigrina	8	0.06	6	0.11	8	0.09
D. caerulescens			3	0.02	7	P
D. coronata	4	0.06	5	0.16	5	0.02
D. virens					1	P
D. fusca					1	P
D. dominica	3	0.01	5	0.06	1	P
D. discolor	7	0.04	9	0.25	8	0.19
D. palmarum	4	0.04	4	0.09	4	0.02
Mniotilta varia	13	0.19	9	0.56	8	0.71
Setophaga ruticilla	11	0.18	9	0.14	8	0.45
Protonotaria citrea	7	0.05	4	0.02	3	P
Helmitheros vermivorus			3	0.02	8	0.17
Seiurus aurocapillus			4	0.03	8	0.28
S. noveboracensis	13	0.72	9	1.91	8	0.67
S. motacilla	1	P	3	0.02	4	0.01
Oporornis formosus			2	0.02	3	0.01
Geothlypis trichas	5	0.03	6	0.05	1	P
Wilsonia citrina			4	0.04	8	0.08

¹Counts - number of counts on which the species has been recorded (out of 14 counts on SC, 10 on ST, and 9 on SJ). ph - number of individuals recorded per party hour, all counts combined (P - present but < 0.01/ph).

Species Accounts

Vermivora pinus. Blue-winged Warbler.

St. Croix - Sightings, 18 October and 15 November (Norton 1987a). Listed as accidental (Sladen 1987).

St. Thomas - Two sightings, perhaps of a single individual, 11 and 19 December 1985 (Norton 1986a, CBC).

St. John - Observations from four winter seasons, 1979 (CBC), 13 December 1981 (Norton 1982a) and 18 March 1982 (Norton 1982b), 18 December 1982 (Norton 1983b, CBC), and 19 December 1987 (Norton 1988b).

Vermivora chrysoptera. Golden-winged Warbler.

St. John - Sighting, 18 December 1985 (Norton 1986a, CBC).

Vermivora peregrina. Tennessee Warbler.

St. John - Photograph, at least one at a feeder, 17 March 1986 (Norton 1986b).

Parula americana. Northern Parula. Described as "probably the most common of the migrant warblers in the Virgin Islands" (Danforth 1930). CBC results indicate that either it or the Northern Waterthrush holds this distinction.

St. Croix - Twelve specimens: seven from 20 January-7 February 1890 (2 in the British Museum of Natural History [BMNH], 5 in FM; the latter reported in Cory 1891, 1892 and

Hellmayr 1935 [several collectors sent specimens from the West Indies to the FM late in the Nineteenth Century; on the basis of these, Cory published island lists, generally without dates or numbers of specimens. Later, Hellmayr listed the number of specimens in the FM from each locale, usually Cory's birds in the case of the West Indies, without mention of dates]), two from 19-20 February 1904 (BMNH; Nicoll 1904), 25 December 1926 (USNM, Danforth 1930), and 5 and 26 November 1939 (FM, not in literature). Sightings, December and January (Danforth 1930), from 30 September to 30 April (Beatty 1930), and as late as 6 May 1858 (Newton and Newton 1859).

St. Thomas - Fourteen specimens located: three from 14 November 1889 (FM, Cory 1891, 1892), 21 March 1892 (FM, all four in Hellmayr 1935), three from 19 December 1903, two from 22 February 1904, and 2 from 7 January 1906 (the last seven all BMNH, not in literature) 25 March 1917 (Museum of Comparative Zoology, Harvard [MCZ], not in literature), and two undated (one each in the American Museum of Natural History [AMNH] and FM). Cassin (1860) noted a specimen, perhaps the one in the AMNH. Sightings, December and January (Danforth 1930).

St. John - Robertson (1962) considered this the "second most common wood warbler" on St. John. Reported in eight CBC's.

Jost van Dyke - Sighting, 1 January 1934 (Danforth 1935).

Tortola - Three specimens: 20 November 1889 (FM, Cory 1890, 1892, Hellmayr 1935), 25 December 1928 (USNM, Danforth 1930 cited observations from this period, but did not refer to this specimen), and 2 March 1917 (MCZ, not in literature).

Virgin Gorda - Two specimens: 11 and 14 December 1889 (FM, Cory 1890, 1892, Hellmayr 1935).

Anegada - Sighting, January 1970 (LaBastille and Richmond 1973).

Dendroica petechia cruciana. Yellow Warbler. The only permanent resident warbler in the Virgin Islands. I know of no reports of transient individuals of other subspecies. D. p. cruciana as currently recognized occurs on Puerto Rico and adjacent islands as well as the Virgin Islands. It was initially described in 1870 by Sundevall on the basis of a type specimen from St. Croix referred to by Newton and Newton (1859, now in BMNH). Subsequently, Puerto Rican and Virgin Island birds were thought to be closely related to those from the northern Lesser Antilles and were included in D. p. bartholemica and/or ruficapilla. Peters (1927) considered Puerto Rican and St. Croix birds to be distinct, and resurrected the name cruciana for them; he left birds from St. Thomas and islands to the east grouped with Lesser Antillean birds in bartholemica. Wetmore (1927) decided that the Anegada Channel separated the subspecies, and placed all Virgin Island birds in cruciana.

St. Croix - Thirty-two specimens: 6 May 1857, ? July 1858 (both BMNH, one or the other of these was referred to by Newton and Newton 1859 and Sharpe 1885), ten from 18 January to 4 February 1890 and one on 22 December 1890 (FM, Cory 1891, 1892, Hellmayr 1935), three from 10-14 September 1914 (MCZ, Wetmore 1927), 20 February 1904 (Newton 1904), three from 27 December 1926 to 1 January 1927 (USNM, Danforth 1930), nine from 18 February to 10 March 1945 (five in the Delaware Museum of Natural History and four in the University of Michigan Museum of Zoology, or UMMZ), one on 12 August 1952 (Academy of Natural Sciences of Philadelphia [ANSP]) and two on 4 August 1964 (Louisiana State University Museum of Zoology [LSU]). Newton and Newton (1859) indicated that clutch size always seemed to be three, and Beatty (1930) reported a nest in May with three eggs.

St. Thomas - Thirty-four specimens, 23 from St. Thomas: one each from an unstated date in 1870 (BMNH, Sharpe 1885) and 19 December 1903 (BMNH, not in literature), three from 22 February 1904 (BMNH, Nicoll 1904), three from 7 January 1906 and one each from 14 February and 15 May 1908 (BMNH, not in literature), six from 12 August to 6 September 1916 (AMNH, not in literature), eight from 16 February to 30 March 1917 (MCZ, listed by Peters 1927), one on 14 January 1927 (USNM, Danforth 1930), one on 25 July 1964 (LSU), and eight undated (four in USNM, two in AMNH, perhaps including the "numerous specimens" collected by Swift mentioned by Cassin 1860 and the specimen noted by Ridgway 1884 and

Wetmore 1927 taken between 17 and 24 January 1884). In addition, I located a specimen from Little Saba dated 18 June 1935 (USNM, Danforth 1935). There is a nest record from Saba Cay (found with 2 eggs on May 27, Nichols 1943), and a report that Yellow Warblers are abundant in scrub growth on Water Island (Beatty 1938).

St. John - Five specimens: 6 January 1927 (USNM, Danforth 1930), and four from 8 July to 5 August 1957 (University of Kansas Museum of Natural History, not in literature). Nichols (1943) and Robertson (1962) both reported this species to be common in mangroves and open vegetation but absent from heavily wooded areas.

Jost van Dyke - Sighting, 1 January 1934 (Danforth 1935).

Tortola - Five specimens from Tortola: three from 1-6 March 1917 (MCZ, Peters 1927), 25 and 27 December 1928 (USNM, Danforth 1930). Three specimens from adjacent Beef Island: 12 August 1964 (LSU, not in literature). Sighting on Beef Island, 28 December 1933 (Danforth 1935).

Virgin Gorda - Twenty-five specimens: 24 from 27 November to 14 December 1889 (19 in FM, three in BMNH, one each at Cornell University and the Carnegie Museum, [CM], Cory 1890, 1892, Hellmayr 1935), and one from 19 March 1916 (MCZ).

Anegada - Twenty-seven specimens: 18 from 20 to 31 December 1889 (14 in FM, two in BMNH, one each in AMNH and USNM, Cory 1890, 1892, Hellmayr 1935), seven from 8 to 15

March 1917 (five in MCZ, two in UMMZ, Peters 1927), one each from 7 March 1936 (USNM) and 18 August 1964 (LSU). Many sighted in mangroves in 1970 (LaBastille and Richmond 1973).

Dendroica pensylvanica. Chestnut-sided Warbler.

St. Croix - Sighting, 11 October 1987 (Norton 1988a).

St. John - Sightings, 27 March and 8 April 1978 (Norton 1979), 26 March 1982 (Norton 1982b), 24 January 1984 (Norton 1984b), 17 November 1987 (Norton 1988a), and in 1979 CBC.

Dendroica magnolia. Magnolia Warbler.

St. Croix - Listed as accidental in migration (Sladen 1987).

St. Thomas - Listed as rare (Raffaele 1983). Reported in 1983 CBC.

St. John - Sightings: one or more birds on 25 February and 2 and 8 March at two localities (Bond 1957, Robertson 1962), 11 reports in files kept by the National Park Service (Raffaele, pers. comm.), and inclusion in five CBC's.

Dendroica tigrina. Cape May Warbler. Regular, but not abundant in the winter.

St. Croix - Nine specimens: one on 21 January 1890 (FM, Cory 1891, leading to listing by Cory 1892, Ridgway 1902, Wetmore 1927, Danforth 1935, and Hellmayr 1935), and eight from 12 December to 21 April collected from 1939 to 1941 (all FM, not in literature). Newton and Newton (1859) noted

a specimen (not located) dated 19 March 1857. Beatty (1930) considered the species "regular" and listed observation dates from 8 September to 19 April. Reported on eight CBC's.

St. Thomas - One specimen, from the winter of 1864-65 (USNM, noted by Wetmore 1927). Reported on six CBC's (maximum number = 6).

St. John - Specimen, 1880 (Robertson 1962, not located). Sightings, 17 and 18 February (Robertson 1962), and in eight CBC's.

Tortola - Sighting, 13 April 1979 (Norton 1981a).

Dendroica caerulescens. Black-throated Blue Warbler.
Uncommon winter resident.

St. Croix - Two specimens: 26 February 1938 (USNM, noted by Beatty 1939) and 23 March 1940 (ANSP, not in the literature). Listed as very rare in winter (Sladen 1987).

St. Thomas - One specimen, 26 October 1970 (USNM, not in the literature). Reported on three CBC's.

St. John - Robertson (1962) considered this species uncommon but generally distributed in humid forest from February 25 through March 10 (also in Bond 1957). Sightings: 17 October 1980 (Norton 1981a), and in seven CBC's.

Anegada - Sighting in April 1970 (LaBastille and Richmond 1973).

Dendroica coronata. Yellow-rumped Warbler (presumably always the Myrtle type). Uncommon winter resident.

St. Croix - Two specimens: 17 December 1956 (ANSP) and 27 December 1937 (USNM). Sightings: 30 March 1933 (Beatty 1936), and in four CBC's.

St. Thomas - One specimen, 6 January 1950 (ANSP, Bond 1966). Sightings: 15 November 1983 (Norton 1984a), from 23 December 1982 through 24 February 1983 (Norton 1983b), and in five CBC's.

St. John - James Bond wrote a letter to Robertson (1962) indicating that Seaman had seen a Yellow-rumped Warbler on St. John in March 1956 (alluded to by Bond 1957). Also reported in five CBC's.

Virgin Gorda - Sighting, undated (Bond 1976).

Dendroica virens. Black-throated Green Warbler. Occurs during migration and may overwinter on occasion.

St. Croix - Three specimens: 24 April and 8 May 1941 and 29 September 1942 (all FM, not in literature). Beatty (1930) noted two other specimens (not located) taken 18 October 1919. This species appears to be a transient or vagrant during migration. However, Beatty (1943) claimed to have observed a male Golden-cheeked Warbler (Dendroica chrysoparia) on 23 November 1939 and again on 8 January 1940. Bond (1950) considered this report "questionable," and suggested that Beatty had actually seen a Black-throated Green Warbler. Although considerably more likely, such

sightings of D. virens would nonetheless constitute the first mid-winter reports for the island.

St. Thomas - Although not noted on St. Thomas proper, Bond (1959) saw an individual on nearby Water Island (date not specified).

St. John - Three sightings: 27 February (Norton 1983b) and 10 March (Robertson 1962, also in Bond 1957), and on one CBC.

Dendroica fusca. Blackburnian Warbler.

St. John - Norton (1981a) noted two separate observations on or around 27 December 1978, possibly of a single bird. Bond (1982) found this report to be unacceptable in view of a lack of other winter West Indies records. Subsequently, there have been spring observations from 19 to 23 March 1982 (Norton 1982b) and one CBC report.

Dendroica dominica. Yellow-throated Warbler. At the eastern extreme of its winter range in the Virgin Islands.

St. Croix - Reported on three CBC's. Listed as uncommon in winter (Sladen 1987).

St. Thomas - Wetmore (1927) and Danforth (1935) questioned records from St. Thomas published by Ledru in 1810. Since then, there have been sightings from 7 and 9 January 1978 (Norton 1979), 12 November 1980 (Norton 1981b), and on five CBC's.

St. John - Sightings: December 1959 (Bond 1964), and on one CBC.

Dendroica discolor. Prairie Warbler. Winters regularly; reported relatively frequently on CBC's (Table 2).

St. Croix - Twelve specimens: five from 20 January to 6 February 1890 (three in FM, Cory 1891, 1892, Hellmayr 1935, and two in BMNH), two from 20 February 1904 (BMNH, Nicoll 1904), 14 September 1914 (MCZ, Wetmore 1927), 26 December 1940 (USNM, Danforth 1930), 5 October 1939 and 2 April and 26 December 1940 (all FM, not in literature). In addition, a specimen collected 24 October 1940 (not located) has been identified as D. d. paludicola (Beatty 1941, Bond 1950, Nolan 1978; all other specimens are presumably of the nominate subspecies). The most extreme observation dates are 1 September and 23 April (Beatty 1930). In general, the Prairie Warbler is associated with dry deciduous forest on St. Croix (Nolan 1978).

St. Thomas - Four specimens: 22 February 1904 (BMNH, Nicoll 1904), 3 January 1927 (USNM), and two undated (AMNH).

St. John - One specimen, 6 January 1927 (USNM, Danforth 1930). Sightings: 7 January 1927 (Danforth 1930), and in eight CBC's. Robertson (1962) considered this species common in dry forest vegetation.

Tortola - Three specimens: 22 and 25 November 1889 (FM, Cory 1890, 1892, Hellmayr 1935), 24 December 1928 (USNM,

Danforth 1930, who observed birds on the next two days as well).

Virgin Gorda - Eleven specimens: from 30 November to 17 December 1899 (nine in FM, Cory 1890, 1892, Hellmayr 1935, two in BMNH). Sighting, 1 January 1929 (Danforth 1930).

Anegada - Two specimens: 21 December 1889 (FM, Hellmayr 1935), 15 March 1919 (MCZ, not in literature).

Dendroica palmarum. Palm Warbler. The Virgin Islands are the eastern extreme of this bird's winter range.

St. Croix - Specimen, 12 March 1932 (FM, not in the literature). Beatty (1930) published observation dates ranging from 6 October to 30 April and considered this species regular in open country. Sighting, 8 February (Norton 1987b).

St. Thomas - Specimen, 16 December 1967 (Bond 1968, not located). Reported on four CBC's.

St. John - Sightings: 18 December 1982 (Norton 1983b), and in four CBC's.

Tortola - Sighting, 3 April (Norton 1981a).

Dendroica castanea. Bay-breasted Warbler.

St. Croix - Two specimens: 23 October 1940 (FM) and 5 May 1935 (USNM).

Dendroica striata. Blackpoll Warbler. Strictly a fall migrant.

St. Croix - Four specimens: 23 (FM) and 24 October 1940 (ANSP, both in Beatty 1941), and two on 18 October 1962 (ANSP, not in literature). Subsequent to the 1940 collection dates, Beatty (1941) continued to observe individuals in a field overgrown with acacia for two weeks.

St. Thomas - Sighting of four individuals, 21 October 1982 (Norton 1983a).

St. John - Sightings: 4 and 6 November 1940 (Robertson 1962), and 1 November 1983 (Norton 1984a).

Mniotilta varia. Black-and-white Warbler. Winters fairly commonly, at least in the U.S. Virgin Islands; regularly reported in CBC's (Table 2).

St. Croix - Nine specimens located: four from 20 January to 28 March 1890 (FM, Cory 1891, 1892, one noted by Hellmayr 1935), one each from 20 February 1904 (BMNH, Nicoll 1904), 28 December 1926 (USNM, noted by Danforth 1930 from 26 December), 24 and 31 October 1939 (FM, not in literature), and 20 April 1953 (ANSP, not in literature). Nicoll (1904) and Beatty (1930) collected additional specimens. Observed as early as 10 September (Beatty 1930).

St. Thomas - Three specimens; two undated (USNM, noted by Wetmore 1927) and one from 22 February 1904 (BMNH, Nicoll 1904).

St. John - Robertson (1962) considered this the fourth most abundant wintering warbler species on St. John. It has been noted on eight CBC's.

Setophaga ruticilla. American Redstart. Reasonably common; a winter resident apparently throughout the Virgin Islands; reported on most CBC's (Table 2).

St. Croix - Ten specimens located: seven from 20 January-5 February 1890 (five in FM, Cory 1891, 1892, Hellmayr 1935, two in BMNH), one each on 30 September 1938, 30 September 1939 (both FM, not in literature), and 20 April 1959 (ANSP, not in literature). Newton and Newton (1859) noted a 17 March 1858 specimen (not located) and extreme observation dates of 6 September and 1 May. A 1 September date (Beatty 1930) is the earliest published.

St. Thomas - Seven specimens: two from 22 February 1904 (BMNH, Nicoll 1904), 29 August 1916 (AMNH, not in literature), 3 January 1927 (USNM, Danforth 1930), and three undated (USNM; Wetmore 1927 presumably included these three in a reference to five skins in the USNM).

St. John - Robertson (1962) considered this the third most common warbler on St. John and noted that a specimen (not located) had been collected by Ober. Sighting, 6 January 1927 (Danforth 1930).

Tortola - Two specimens: 24 November 1889 (FM, Cory 1890, 1892, Hellmayr 1935) and 31 December 1928 (USNM, Danforth 1930, who had also observed a bird five days earlier).

Virgin Gorda - Three specimens: 7 and 13 December 1889 (one in BMNH, two in FM, Cory 1892).

Protonotaria citrea. Prothonotary Warbler. Winters occasionally. Raffaele (1983) pointed out that because this species rarely strays from mangrove habitat, it may go largely undetected and may be more common than the paucity of records indicates.

St. Croix - Specimen, 6 October 1940 (FM, noted by Beatty 1941). Sightings: December 1972 CBC (Leck 1975) and from six subsequent CBC's.

St. Thomas - Two sightings: 2 January 1978 in a wooded swamp and another on Cas Key, off the southeast coast of St. Thomas, 5 March 1978 (Norton 1979).

St. John - Listed in the Virgin Islands National Park checklist "Birds of St. John" (Bond 1965). Sightings, 17 October 1980 (Norton 1981a), and in three CBC's.

Helmitheros vermivorus. Worm-eating Warbler. This species may normally be a transient migrant on St. Croix and other islands, but may overwinter on St. John. That this forest-dweller, like the Ovenbird and Kentucky Warbler, is most common on St. John is not surprising in that the forest is much denser there than elsewhere.

St. Croix - Three specimens: one each on 31 October 1940 and 9 April 1941 (FM; Beatty 1941 claimed, apparently somewhat in error, to have collected two birds on the first of these dates and observed another on the second), and 12 April 1954 (ANSP). Sighting, December (Norton 1987b).

St. John - Robertson (1962) commented that this bird is "surprisingly numerous in the heavier forests of St. John" and that he had observations from 16 February to 10 March. It has been noted in eight of nine CBC's.

Limnothlypis swainsonii. Swainson's Warbler.

St. John - Norton (1979) wrote that there were sightings at one locality on 28 February and 27 March 1978 and later added (Norton 1981a) that another observer had independently identified this species from the same locale on 19 January of the following year. Bond (1982) found this report to be "unacceptable" because it was from far east of the birds' known range and published without sufficient detail. However, he subsequently wrote (Bond 1984) that there were two records from St. John.

Seiurus aurocapillus. Ovenbird. A regular, but uncommon, winter resident. Because it is one of the more inconspicuous warblers during winter, it may be more common than noted.

St. Croix - Four specimens: 27 January 1890 (FM, Cory 1892, Hellmayr 1935), 29 December 1926 (USNM, Danforth 1930), 30 September 1939, and 3 January 1940 (FM, not in literature). Sightings include an earlier date (15 September, Beatty 1930), and later dates (April, Newton and Newton 1859; 18 April, undocumented, Bent 1953).

St. Thomas - Two specimens, neither dated (USNM, Wetmore 1927 referred to one of these). Reported on four CBC's.

St. John - Robertson (1962) considered this an uncommon species that is "largely confined to moist forest areas near stream beds." Although there are no specimens or published dates, it has been reported in eight of the nine CBC's held.

Tortola - Sighting, 24 December 1928 (Danforth 1930).

Anegada - Sightings in January and April of 1970 (LaBastille and Richmond 1973).

Seiurus noveboracensis. Northern Waterthrush. Perhaps the most abundant wintering warbler in the Virgin Islands; one of the most commonly reported in CBC's (Table 2).

St. Croix - Ten specimens: two from 30 September 1939 (FM), two from December and one from January (USNM), two from March (FM), and three from April (two in USNM, one in FM dated 5 April 1940). Danforth (1930, 1935) referred to all USNM specimens (FM specimens are not in the literature). Cory (1891) reported another specimen that I have not located. Sightings from more extreme dates include 1 September (Beatty 1930) and 5 May (Bent 1953, undocumented). Beatty (1930) considered the bird common along streams, ponds, and lagoons.

St. Thomas - Three specimens: 2 and 6 September 1916 (AMNH, not in literature) and 23 February 1917 (MCZ, not in literature). Sightings: 16 August 1982 (Norton 1983a), 10

September 1984 (Norton 1985), and 4 January 1927 (Danforth 1930).

St. John - One specimen, 6 January 1927 (USNM, Danforth 1930, who observed eight other individuals on that date). Robertson (1962) considered this species the most abundant wintering warbler on St. John and commented that it inhabits not only mangroves but stream beds in moist forest.

Jost van Dyke - Danforth (1935) collected one specimen (not located) and observed five other individuals on 1 January 1934.

Tortola - Five specimens: four from 27-30 December, 1928 and 1933 (USNM, Danforth 1930, 1935), one from 6 March 1917 (MCZ, not in literature).

Virgin Gorda - Sighting of two individuals in mangroves, 1 January 1929 (Danforth 1930).

Anegada - Sightings in January and April, 1970 (LaBastille and Richmond 1973).

Seiurus motacilla. Louisiana Waterthrush. Occurs during migration; some may overwinter.

St. Croix - Three specimens: 4 August 1939 and 19 September 1939 (FM, not in literature) and 18 November 1933 (USNM, Danforth 1935). Sightings: 20 August 1971 (Leck 1975) and in one CBC.

St. Thomas - Five specimens: one on 19 December 1903 and three from 22 February 1904 (BMNH, Bond 1958), 16 February 1917 (MCZ, not in literature). Sightings, 6 September 1983

(Norton 1984a), 26 March (Norton 1980a), and in three CBC's..

St. John - Sightings: 26 July (Norton 1980b), 18 August (Norton 1984a), 17 April (Norton 1980a), and in four CBC's.

Jost van Dyke - Sighting, 17 August 1980 (Norton 1981b).

Oporornis formosus. Kentucky Warbler. May overwinter infrequently. That the bulk of reports come from St. John is probably due to better conditions there for this forest-dwelling species.

St. Croix - Sighting, 11 October 1987 (Norton 1988a).

St. Thomas - Inclusion by Raffaele (1983) was based upon a 21 December 1980 CBC sighting (Raffaele, pers. comm.). Also reported in the 1985 CBC.

St. John - Sightings: one or perhaps more individuals from 19 February to 8 March (Robertson 1962). Raffaele (1983) included four reports from St. John, three on the basis of reports from December and January in National Park Service files (Raffaele, pers. comm.). Noted by Norton (1984b) and reported in three CBC's.

Oporornis agilis. Connecticut Warbler.

St. John - Raffaele (1983) wrote that there is a "questionable record from St. John" based upon a sight report in National Park Service files dated 3 April 1962 (Raffaele, pers. comm.).

Geothlypis trichas. Common Yellowthroat. Reported infrequently in winter.

St. Croix - One specimen, 4 April 1958 (ANSP, noted by Seaman 1959, Bond 1959, and Raffaele 1983). Reported in five CBC's and listed as very rare in winter (Sladen 1987).

St. Thomas - Sightings: 14 December 1967 (Bond 1968), 17 and 21 December and 2 January (Norton 1981), 12 January 1982 (Norton 1982b). These dates may include some of the six CBC reports.

St. John - Sightings: 19 January (Norton 1981a), 10 and 23 January (Norton 1982a), and on six CBC's.

Tortola - Sighting, 13 April (Norton 1981a).

Anegada - Sighting of a male and a female, 14 March 1981 (Norton 1981a).

Wilsonia citrina. Hooded Warbler. Occurs during spring migration; some individuals may overwinter.

St. Croix - Three specimens: 14 March 1954 (ANSP), 17 March 1941 (FM, Beatty 1941), and 6 April 1945 (USNM). Sightings: 16 March (Bond 1942) and December (Norton 1987b).

St. Thomas - Sightings: from nearby Water Island, 7 March 1964 (Bond 1968), and on four CBC's.

St. John - Robertson (1962) reported five observations between 19 February and 2 March (also in Bond 1957), and further noted that Seaman had observed a bird in March of 1956. Reported on eight CBC's (maximum number = 7).

Wilsonia canadensis. Canada Warbler. There are no completely reliable records from anywhere in the West Indies east or south of Cuba. Its reported occurrence in the Virgin Islands is based upon a specimen that I have not located from a time when the species is typically restricted to South America.

St. Croix - Beatty (1930) wrote that he collected a male Canada Warbler on 17 February 1924. All subsequent references are to this bird, a specimen that I have not located.

St. Thomas - Sighting, 3 April 1961 (Bond 1962).

Discussion

Thirty species of warblers have been reported from the Virgin Islands. I have been able to document the occurrence of 19 species through museum specimens. The presence of one species (Vermivora peregrina) is documented by a photograph and a specimen of a Canada Warbler which I have not located is reported in the literature. The occurrence of the other nine species is based entirely upon sight reports.

One species, Dendroica petechia, is a permanent resident. Frequent records spanning a number of months on at least one of the Virgin Islands are an indication of regular winter occurrence of eight species (Parula americana, Dendroica tigrina, D. discolor, D. palmarum,

Mniotilta varia, Setophaga ruticilla, Seiurus aurocapillus, and Seiurus noveboracensis). There are five other species (Dendroica caerulescens, D. coronata, Protonotaria citrea, Seiurus motacilla, and Geothlypis trichas) for which scantier data suggest that at least some individuals overwinter in some years. Some species appear to be semi-regular transients. Dendroica castanea, D. virens, and Helmitheros vermivorus have been recorded during both fall and spring migrations (Seiurus motacilla may be better considered a transient than an irregular overwinterer) . Dendroica striata occurs only as a fall migrant and Wilsonia citrina occurs only during the spring. The status of the remaining eleven species must currently be considered accidental or, in some cases, hypothetical.

LITERATURE CITED

- Beatty, H. A. 1930. Birds of St. Croix. J. Dept. Agric.
Porto Rico 14:135-150.
- _____. 1936. New bird record for St. Croix, V.I. Auk
53:456-457.
- _____. 1938. Notes from St. Thomas and cays, Virgin
Islands. Auk 55:552-553.
- _____. 1939. Notes from the Virgin Islands, West Indies.
Auk 56:193.
- _____. 1941. New bird records and some notes for the
Virgin Islands. J. Agric. Univ. Puerto Rico 25:32-36.
- _____. 1943. Records and notes from St. Croix, Virgin
Islands. Auk 60:110-111.
- Bent, A. C. 1953. Life histories of North American wood
warblers. Bull. U.S. Nat. Mus. 203:1-734.
- Bond, J. 1942. Additional notes on West Indian birds.
Proc. Acad. Nat. Sci. Philadelphia 94:89-106.
- _____. 1950. Check-list of birds of the West Indies. 3rd
ed. Acad. Nat. Sci. Philadelphia. 200 p.
- _____. 1957. Second supplement to the check-list of birds
of the West Indies (1956). Acad. Nat. Sci.
Philadelphia. 14 p.
- _____. 1958. Third supplement to the check-list of birds
of the West Indies (1956). Acad. Nat. Sci.
Philadelphia. 11 p.

- _____. 1959. Fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 12 p.
- _____. 1962. Seventh supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 11 p.
- _____. 1964. Ninth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 13 p.
- _____. 1965. Tenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 16 p.
- _____. 1968. Thirteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 12 p.
- _____. 1976. Twentieth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 14 p.
- _____. 1982. Twenty-fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 16 p.
- _____. 1984. Twenty-fifth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 22 p.
- Cassin, J. 1860. Catalogue of birds from the island of St. Thomas, West Indies, collected and presented to the

- Academy of Natural Sciences by Mr. Robert Swift. With notes. Proc. Acad. Nat. Sci. Philadelphia 13:374-379.
- Cory, C. B. 1890. On a collection of birds made during the winter of 1889-90, by Cyrus S. Winch, in the islands of St. Thomas, Tortola, Anegada, and Virgin Gorda, West Indies. Auk 7:373-375.
- _____. 1891. A list of the birds collected in the islands of St. Croix and St. Kitts, West Indies, during March and April, and in Guadeloupe during August, September, and October, 1890. Auk 8:47-49.
- _____. 1892. Catalogue of West Indian birds, containing a list of all species known to occur in the Bahama Islands, the Greater Antilles, the Caymans, and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Publ. by author, Boston. 163 p.
- Danforth, S. T. 1930. Bird records from the Virgin Islands. J. Dept. Agric. Porto Rico 14:107-134.
- _____. 1935. Supplementary account of the birds of the Virgin Islands, including Culebra and adjacent islets pertaining to Puerto Rico, with notes on their food habits. J. Agric. Univ. Puerto Rico 19:439-472.
- Hellmayr, C. E. 1935. Catalogue of birds of the Americas and adjacent islands. Field Mus. Nat. Hist., Zool. Ser. 13: Part 8:1-541.
- LaBastille, A. and M. Richmond. 1973. Birds and mammals of Anegada Island, British Virgin Islands. Carib. J. Sci. 13:91-109.

- Leck, C. F. 1975. Notes on unusual and rare birds of St. Croix. Condor 77:107.
- Leopold, N. F. 1963. Checklist of birds of Puerto Rico and the Virgin Islands. Univ. Puerto Rico Agric. Exp. Sta. Bull. 168. 119 p.
- Newton, A. and E. Newton. 1859. Observations on the birds of St. Croix, West Indies, made, between February 20th and August 6th 1857 by Alfred Newton, and, between March 4th and September 28th 1858 by Edward Newton. Ibis 1:59-69, 138-150, 252-264, 365-379.
- Nichols, R. A. 1943. The breeding birds of St. Thomas and St. John, Virgin Islands. Mem. Soc. Cubana Hist. Nat. 17:23-37.
- Nicoll, M. J. 1904. On a collection of birds made during the cruise of the 'Valhalla', R.Y.S., in the West Indies (1903-4). Ibis 1904:555-591.
- Nolan, V., Jr. 1978. The ecology and behavior of the Prairie Warbler Dendroica discolor. Ornithol. Monogr. 26:1-595.
- Norton, R. L. 1979. New records of birds for the Virgin Islands. Am. Birds 33:145-146.
- _____. 1980a. The spring migration: West Indies region. Am. Birds 34:818-819.
- _____. 1980b. The nesting season: West Indies region. Am. Birds 34:932-933.
- _____. 1981a. Additional records and notes of birds in the Virgin Islands. Am. Birds 35:144-147.

- _____. 1981b. The autumn migration: West Indies region.
Am. Birds 35:231-232.
- _____. 1982a. The winter season: West Indies region. Am.
Birds 36:334.
- _____. 1982b. The spring migration: West Indies region.
Am. Birds 36:897-898.
- _____. 1983a. The autumn migration: West Indies region.
Am. Birds 37:228-229.
- _____. 1983b. The winter season: West Indies region. Am.
Birds 37:342-344.
- _____. 1984a. The autumn migration: West Indies region.
Am. Birds 38:251-253.
- _____. 1984b. The winter region: West Indies region. Am.
Birds 38:361-362.
- _____. 1984c. The spring migration: West Indies region.
Am. Birds 38:968-970.
- _____. 1985a. The autumn migration: West Indies region.
Am. Birds 39:107-108.
- _____. 1985b. The winter season: West Indies region. Am.
Birds 40:338-339.
- _____. 1985c. The spring migration: West Indies region.
Am. Birds 40:528-529.
- _____. 1986a. The winter season: West Indies region. Am.
Birds 40:338-339.
- _____. 1986b. The spring migration: West Indies region.
Am. Birds 40:528-529.

- _____. 1987a. The autumn migration: West Indies region.
Am. Birds 41:151-152.
- _____. 1987b. The winter season: West Indies region. Am.
Birds 41:334-335.
- _____. 1988a. The autumn migration: West Indies region.
Am. Birds 42:142-144.
- _____. 1988b. The winter season: West Indies region. Am.
Birds 42:327-328.
- Philibosian, R. and J. A. Yntema. 1977. Annotated
checklist of the birds, mammals, reptiles, and
amphibians of the Virgin Islands and Puerto Rico.
Information Services, Frederiksted, St. Croix, U.S.V.I.
49 p.
- Raffaele, H. A. 1983. A guide to the birds of Puerto Rico
and the Virgin Islands. Fondo Educativo Interamericano,
San Juan, Puerto Rico. 255 p.
- Ridgway, R. 1902. The birds of North and Middle America.
Part II. Bull. U.S. Nat. Mus. 50:1-834.
- Robertson, W. B., Jr. 1962. Observations on the birds of
St. John, Virgin Islands. Auk 79:44-76.
- Seaman, G. A. 1959. New bird records for St. Croix, Virgin
Islands. Wilson Bull. 71:96.
- Sharpe, R. B. 1885. Catalogue of birds in the British
Museum. Vol. 10. The British Museum, London. 682 p.
- Sladen, F. W. 1987. Checklist of birds of St. Croix, U. S.
Virgin Islands. Publ. by author, St. Croix. 4 p.

Wetmore, A. 1927. The birds of Porto Rico and the Virgin Islands. Psittaciformes to Passeriformes. Sci. Survey Porto Rico and Virgin Islands 9:407-571.

WARBLERS OF THE WEST INDIES

II. THE WESTERN CARIBBEAN

This is the second in a series of papers summarizing the distribution and natural history of the wood-warblers of the West Indies. The Western Caribbean is here defined to include seven islands or island groups located south of Cuba, west of Jamaica, and north and east of the continental landmass (Figure 1). These islands are, from northeast to southwest, the Cayman Islands (Cayman Brac, Little Cayman, and Grand Cayman), the Swan Islands (two adjacent islands, Big Swan and Little Swan, administered by Honduras), and three units in the possession of Colombia: Isla de Providencia, Isla San Andres, and the Cayos de Albuquerque.

The ornithological history of the Cayman Islands was summarized by Johnston et al. (1971). A popular field guide (Bradley 1985) incorporated more recent findings. Ornithological work on the Swan Islands was described by Paynter (1956) and included in a survey of Honduras by Monroe (1968). Although it has been visited by a number of ornithologists, Isla de Providencia has not received an overall historical treatment. Paulson et al. (1969) reviewed the history of Isla San Andres. A 1941 expedition (reported by Bond and Meyer de Schauensee 1944) has been the sole ornithological investigation into the Cayos de Albuquerque of which I am aware. The status of wood warblers in the region has never been summarized.

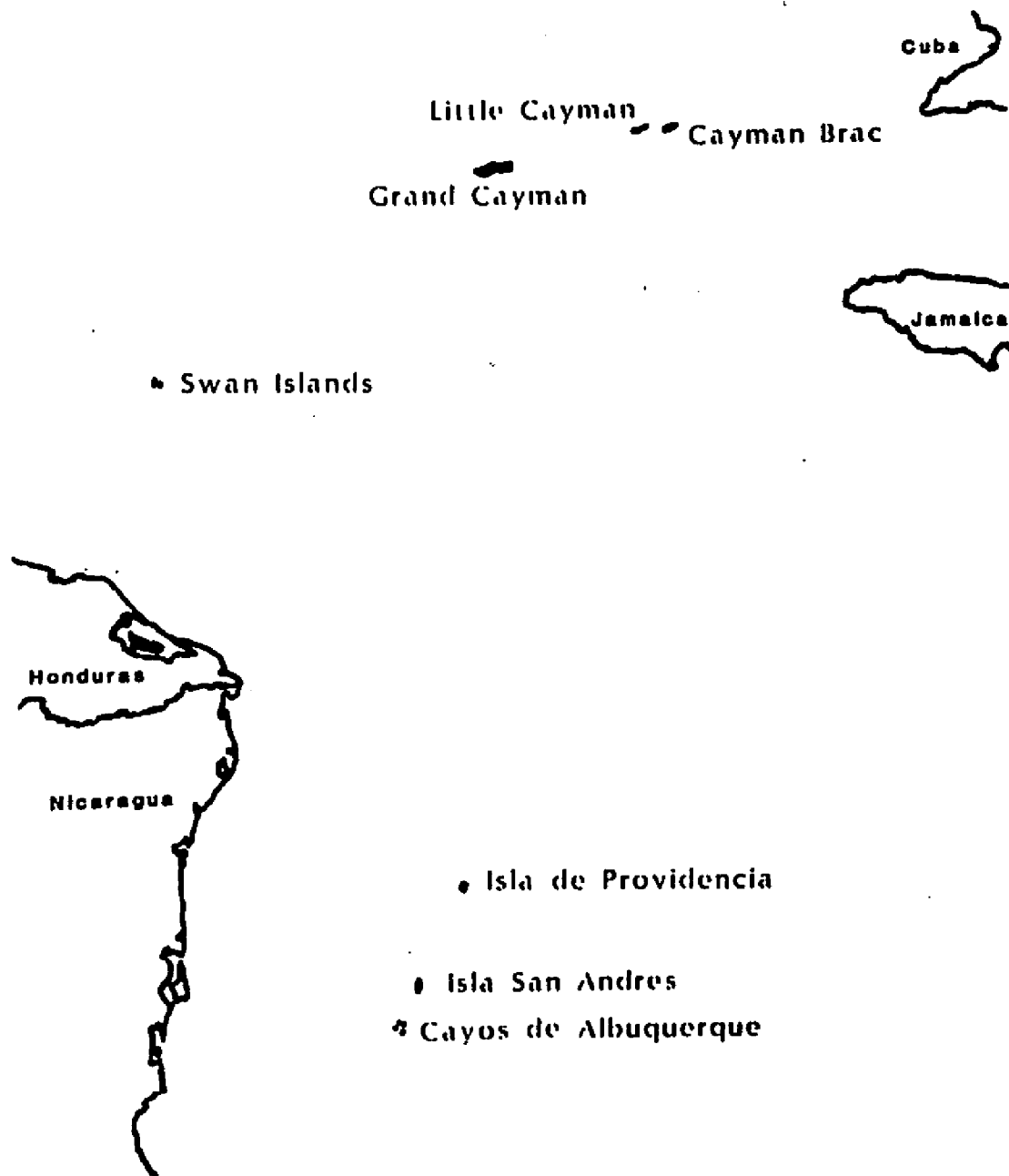


Figure 1. Map of the Western Caribbean, including all islands considered in the text.

The primary data sources for this paper have been the warbler specimens examined in 37 museum collections. The remainder are from published literature. Unpublished sightings have not been included.

There are other islands with Caribbean affinities that are not included in this report. Isla Cozumel will later be treated along with Quintana Roo and the rest of Mexico, the Islas de la Bahia (Bay Islands) with Honduras, and the Islas del Maiz (Corn Islands) with Nicaragua. Other isolated cays in the region are not mentioned simply because there are no reports of warblers from them (or other land birds to my knowledge).

SPECIES ACCOUNTS (see Table 1 for a summarized account)

Vermivora pinus. Blue-winged Warbler.

Grand Cayman - Sighting, 3 inds. in Dec. (Moore 1985, also in Bradley 1985).

Vermivora peregrina. Tennessee Warbler. Bradley (1985) considered this an uncommon transient in scrub woodland.

Cayman Brac - Listed by Bradley (1985).

Little Cayman - Listed by Bradley (1985).

Grand Cayman - 3 specs., all 16-18 April 1892 (FM; Cory 1889, 1892, Ridgway 1902, Hellmayr 1935, Bond 1950b, Johnston et al. 1971); sightings: 2 inds. in mangroves in

Table 1. Evidence for the occurrence of warblers on the islands of the western Caribbean.¹

	CB	LC	GC	SW	PR	SA	CA
<i>Vermivora pinus</i>	-	-	r	-	-	-	-
<i>V. peregrina</i>	r	r	3	-	-	n	?
<i>Parula americana</i>	4	r	5	5	1	n	-
<i>Dendroica petechia</i>	3	8	192	-	2	4	-
<i>D. pensylvanica</i>	-	-	-	-	-	r	-
<i>D. magnolia</i>	r	r	r	-	r	1	-
<i>D. tigrina</i>	n	r	12	1	?	1	-
<i>D. caerulescens</i>	r	?	r	2	-	n	-
<i>D. coronata</i>	r	r	17	9	1	r	-
<i>D. virens</i>	r	r	r	-	r	-	-
<i>D. fusca</i>	r	r	1	r	-	-	-
<i>D. dominica</i>	1	6	7	2	-	-	-
<i>D. discolor</i>	7	6	4	1	-	-	-
<i>D. vitellina</i>	72	43	82	70	-	-	-
<i>D. palmarum</i>	5	3	3	6	?	r	-
<i>D. castanea</i>	r	r	r	-	-	?	-
<i>D. striata</i>	r	1	4	-	r	r	-
<i>D. cerulea</i>	-	-	1	-	-	-	?
<i>Mniotilta varia</i>	r	1	6	3	4	1	-
<i>Setophaga ruticilla</i>	1	?	5	5	r	r	?
<i>Protonotaria citrea</i>	r	1	r	-	r	r	1
<i>Helminthos vermivorus</i>	1	r	2	1	n	2	-
<i>Limnolophus swainsonii</i>	r	-	r	1	-	-	-
<i>Seiurus aurocapillus</i>	1	?	1	5	1	n	-
<i>S. noveboracensis</i>	4	r	6	2	7	1	-
<i>S. motacilla</i>	1	n	1	1	2	-	-
<i>Oporornis formosus</i>	-	r	r	-	n	-	-
<i>Geothlypis trichas</i>	3	1	?	2	-	r	?
<i>Wilsonia citrina</i>	-	-	-	1	-	n	-
<i>Icteria virens</i>	-	-	r	-	-	-	-

¹Numbers - total nos. of specimens located;
 ? - specimen[s] in the literature (not located);
 n - netting record; r - sight reports.
 CB - Cayman Brac; LC - Little Cayman;
 GC - Grand Cayman; SW - Swan Islands;
 PR - Isla Providencia; SA - Isla San Andres;
 CA - Cayos de Albuquerque.

Dec. 1981 and at least 5 in mangroves in Dec. 1983 (Moore 1985).

Isla San Andres - Sightings: 1 ind. in Dec. 1966 and 5 inds. in April 1967 (Paulson et al. 1969); 2 netted, April 1972 (Russell et al. 1979).

Cayos de Albuquerque - 2 specs. reported, 31 March 1941 (Bond and Meyer de Schauensee 1944; not located).

Parula americana. Northern Parula. Bradley (1985) considered this species fairly common from Aug. to April in mangroves, mixed and dry woodland, and forest.

Cayman Brac - 4 specs., 7 and 8 April 1888 (FM; Cory 1889, Hellmayr 1935, Johnston et al. 1971); sightings: 10 to 12 individuals in widely separated areas of the island, mid-Nov. 1973 (Patti et al. 1974), and scattered individuals in woodlands, Nov. 1979 (Olson et al. 1981).

Little Cayman - Listed by Bradley (1985).

Grand Cayman - 5 specs.: 9 and 22 March and 18 April 1892 (FM; not in literature), 28 January 1904 (British Museum [Natural History] [BMNH]; Lowe 1911), and 21 Nov. 1979 (United States National Museum [USNM]; not in literature). The species has been considered fairly common from 21 Nov. to 24 March (Johnston et al. 1971). It was present in scrub woodland in Jan. and Feb. 1975 (Bennett 1980), scattered in woodlands in Nov. 1979 (Olson et al. 1981), and regular in woodlands and on mangrove edges according to Moore (1985). Johnston (1975), in evaluating

habitat use, termed it common in sea grape-almond woodland and mangrove swamps, fairly common in pure logwood (Hematoxylon compechianum) and mixed forests, and uncommon in limestone forest.

Swan Islands - 5 specs.: 4 from 2-18 Feb. 1887 (USNM; Ridgway 1888; Monroe 1968 indicated that this series consisted of 5 specs.), and 1 ind. 28 Feb. 1912 (Museum of Comparative Zoology, Harvard [MCZ]; Paynter 1956).

Isla de Providencia - 1 spec. located, 9 March 1887 (FM; Cory 1887c, Hellmayr 1935 referred to 2 specs. in that collection). Bond and Meyer de Schauensee (1944) cited another ind. collected in March 1941 (not located). Bond (1950a) noted 2 specs., presumably from those mentioned above.

Isla San Andres - 2 inds. netted and 3 others sighted, April 1972 (Russell et al. 1979); 4 inds. sighted, Dec. 1966 (Paulson et al. 1969).

Dendroica petechia. Yellow Warbler. This species is represented in the region by three breeding, permanent resident subspecies. D. petechia armouri is confined to Isla Providencia and D. petechia flavida to Isla San Andres. D. petechia eoa occurs on the three Cayman Islands, as well as on Jamaica. Although birds from the Caymans are morphologically similar to those on Jamaica (Bangs 1916), there is no reason to believe that there is any more gene flow between them than between any other parapatric pair of

West Indian Yellow Warbler subspecies. There are no Yellow Warblers breeding on the Swan Islands or the Cayos de Albuquerque. There is one report of a mainland-breeding migrant from Isla San Andres (see below).

Cayman Brac - 3 specs. located: 2 inds. from 14 July 1911 (MCZ; Bangs 1916, Peters 1927) and 1 from 26 Aug. 1961 (Louisiana State University Museum of Zoology [LSU]; not in literature). Hellmayr (1935) noted 4 specs. in the FM (not located). Johnston et al. (1971) considered the bird very common on all the Caymans, especially in mangrove swamps, and later re-emphasized that it is common in mangrove swamps on Cayman Brac (Johnston 1975). Olson et al. (1981) failed to observe any Yellow Warblers in Nov. 1979. Bradley (1985) considered this species less common on Cayman Brac than on the other two Caymans.

Little Cayman - 8 specs. located: 1 from 20 April 1888 (FM; Cory 1889, Hellmayr 1935), 1 each on 22 and 27 July 1911 (MCZ; probably the specs. noted by Bangs 1916 and Peters 1927), 3 inds. 12-13 Sept. 1930 (USNM), and 2 on 24 Aug. 1961 (LSU). Lowe (1911) noted 2 specimens, probably not among the ones above. Johnston et al. (1971) and Bradley (1985) indicated that the bird is common, particularly in mangroves. Diamond (1980) wrote that, at least in summer, it is confined almost entirely to mangroves and is strictly segregated by habitat from the island's other breeding warbler species, Dendroica vitellina.

Grand Cayman - 192 specs., at least 1 from every month except Oct. Cory (1886b), Nicoll (1904b), Lowe (1909), and Fisher and Wetmore (1931) are among the authors referring specifically to collections. Specimens are located in the following museums: FM (84; Hellmayr 1935 noted 83), USNM (26), LSU (23), BMNH (19), MCZ (13), American Museum of Natural History (AMNH) (12), Royal Ontario Museum (ROM) (7), Delaware Museum of Natural History (DMNH) (2), Florida State Museum (UF) (2), University of Michigan Museum of Zoology (UMMZ) (2), Carnegie Museum of Natural History (CM) (1), and the Los Angeles County Museum of Natural History (LACM) (1). Ridgway (1888) described D. auricapilla and later (Ridgway 1902) reduced the taxon to subspecific status (D. petechia auricapilla). Bangs (1916) felt that birds from the Caymans could not be satisfactorily differentiated from those from Jamaica, and merged them with D. petechia petechia, the name for Jamaican birds at that time. Peters (1927) determined that D. p. petechia should apply to the subspecies on Barbados, and that D. p. eoa should thereafter pertain to Jamaican and Cayman birds. Savage English (1916) described a nest made largely of Thalassia and spider webs that he found on 20 April 1913 in which two eggs were subsequently laid. Johnston et al. (1971) indicated that this was a very common bird, especially in mangroves. Yellow Warblers are common in sea grape-almond woodland and mangroves, fairly common in disturbed sites, and uncommon in forested areas where they breed at times in the same habitat as does the

Vitelline Warbler (Johnston 1975). Bennett (1980) and Moore (1985) noted them in mangroves, and Bradley (1985) indicated that they prefer mangroves but are also found in coastal woodlands. Olson et al. (1981), however, wrote that Alexander Wetmore had not seen many in his visits in 1972 and 1973, and that they felt that the bird was decidedly scarce during their own visit in Nov. 1979. In reference to the statement that the bird is very common, they were prompted to say "this was definitely not the case during our visit, suggesting that perhaps some of these supposedly resident birds are migratory." However, I know of no other indication that any of the resident West Indian Yellow Warbler subspecies migrate. Bradley (1985 and pers. comm.) considered them common.

Isla de Providencia - 2 specs. located, from 13 March 1933 (MCZ). These include the type for D. petechia armouri, a subspecies described as distinct from birds on Isla San Andres (Greenway 1933). Fisher and Wetmore (1931) referred to a 23 April 1929 specimen (not located). Bond (1950b) considered the bird "fairly common in the northern (particularly northeastern) part of the island, inhabiting mainly shrubbery and orchards in open country; rare in mangrove swamps." However, in the same year, he also indicated that this was one of the rarest land birds of Providencia (Bond 1950a). The latter statement is backed by Russell et al. (1979), who failed to find the Yellow Warbler in their visit in April of 1972.

Isla San Andres - 4 specs. located, 8-16 Feb. 1887 (FM; Cory 1887c; Peters 1927 and Hellmayr 1935 indicated that this series consisted of 5 specs.). Cory (1887b) described D. flavida as a new species on the basis of these. Ridgway (1902) was the first to refer to this population as D. petechia flavida. Fisher and Wetmore (1931) wrote of another specimen collected 27 April 1929, and Bond and Meyer de Schauensee (1944) indicated that one or more were taken in March 1933 (none located). Bond (1950a, 1950b) listed it as a rather common, widespread inhabitant of shrubbery, orchards, and mangrove swamps. Russell et al. (1979) confirmed that the resident population remained fairly common in April of 1972 and, furthermore, that they had observed a North American migrant in that month (the latter statement was reiterated by Bond 1980).

Dendroica pensylvanica. Chestnut-sided Warbler.

Isla San Andres - Sighting, 2 inds. in April 1967 (Paulson et al. 1969).

Dendroica magnolia. Magnolia Warbler.

Cayman Brac - Sightings: autumn 1956 (Bond 1958) and from Oct. to Dec. (Johnston et al. 1971).

Little Cayman - Listed by Bradley (1985).

Grand Cayman - Sightings: autumn 1956 (Bond 1957), 18 Dec., 18 April, and 12 May (variously reported by Bond 1968,

1970, and Johnston et al. 1971), and 1 ind. in mangroves and another in roadside scrub in late Dec. 1981 (Moore 1985).

Isla de Providencia - Sighting, April 1972 (Russell et al. 1979, also noted by Bond 1980).

Isla San Andres - 1 spec., 7 April 1972 (ROM); 1 netted (presumably the above specimen) and 3 others observed in April 1972 (Russell et al. 1979). Five observations in Dec. 1966 and one in April 1967 were the first from the island (Paulson et al. 1969).

Dendroica tigrina. Cape May Warbler.

Cayman Brac - Sightings: Nov. and Dec. 1969 (Johnston et al. 1971); 1 netted, late Nov. 1979 (Olson et al. 1981).

Little Cayman - Listed by Bradley (1985).

Grand Cayman - 12 specs.: 9 from 11-19 April 1892 (8 in FM; Cory 1892, Hellmayr 1935; 1 in BMNH), 2 from 11-12 March 1904 (BMNH; Nicoll 1904b), and 1 ind. on 4 April 1967 (LSU; not in literature). Johnston et al. (1971) considered the bird uncommon from Dec. to April, and Johnston (1975) later noted that it inhabits sea grape-almond woodland, mangrove swamps, pure logwood forest, and mixed forest. Bennett (1980) observed birds in scrub woodland in Jan. and Feb. 1975. Olson et al. (1981) netted 1 and observed others, including a group of 8-10 individuals at one locale, in Nov. 1979. Moore (1985) saw them regularly in mangroves and logwood scrub.

Swan Islands - 1 spec., 12 March 1912 (MCZ; Paynter 1956, Bond 1957, Monroe 1968).

Isla de Providencia - 2 specs. reported (neither located): 26 March 1941 (Bond and Meyer de Schauensee 1944) and 26 March 1948 (Bond 1950a).

Isla San Andres - 1 spec., 7 April 1972 (ROM); 2 netted (presumably including the above specimen) and another observed in April 1972 (Russell et al. 1979); sightings of 2 inds. in Dec. 1966 and another in April 1967 (Paulson et al. 1969).

Dendroica caerulescens. Black-throated Blue Warbler. Lowe (1911) considered this a rare winter visitor to the Caymans. Bradley (1985) noted it as fairly common on all three Caymans from Aug. to May in mangroves and coastal and mixed woodlands.

Cayman Brac - Sightings: Nov. and Dec. 1969 (Johnston et al. 1971) and Nov. 1979 (Olson et al. 1981).

Little Cayman - Cory (1889) listed the species, and Hellmayr (1935) noted 1 spec. (presumably in the FM, but not located). Johnston et al. (1971) and Diamond (1980) cited these sources as the only claims from the island.

Grand Cayman - Johnston et al. (1971) considered the species uncommon from 16 Dec. to 11 May. Suitable habitats include sea grape-almond woodland, pure logwood forest, and, particularly, mangroves (Johnston 1975). Moore (1985) saw two individuals in a roadside ditch in Dec. 1981.

Swan Islands - 2 specs.: 9 Feb. 1887 (USNM; Ridgway 1888) and 29 Feb. 1912 (MCZ; Paynter 1956); several sighted, 19 April 1929 (Fisher and Wetmore 1931).

Isla de Providencia - Bond (1980) indicated that Russell et al. (1979) had reported the bird on this island. The original publication, however, made no mention of it.

Isla San Andres - 1 ind. netted and another sighted, April 1972 (Russell et al. 1979, repeated by Bond 1980).

Dendroica coronata. Yellow-rumped Warbler. Lowe (1911) considered this a common winter visitor to the Caymans. Bradley (1985) noted that it had been "reported as very common in the early part of this century," but that it had become uncommon to rare on the three Caymans. This species is perhaps the most irregular on its Neotropical wintering grounds of all the North American breeding migrant warblers (Pashley and Martin, 1988), but I know of no evidence of systematic decline elsewhere in its range. All records either explicitly or presumably refer to D. coronata coronata.

Cayman Brac - Sightings, Nov. and Dec. (Johnston et al. 1971).

Little Cayman - Listed by Bradley (1985).

Grand Cayman - 17 specimens: 11 from 25-28 Jan. 1904 (BMNH; not in literature) and 6 from 10-11 March 1904 (BMNH; Nicoll 1904b collected these and considered the bird very abundant in trees and open fields). Lowe (1909) saw "many"

on the island. Johnston et al. (1971) noted Nicoll's comment but said that the bird had not been recorded in recent years. According to Olson et al. (1981), Wetmore observed a flock on 6 Feb. and noted that the bird was common on 13 and 15 Feb. 1972. Moore (1985) observed 2 birds in wet scrub near mangroves in Dec. 1983.

Swan Islands - 9 specs.: 4 from 2-9 Feb. 1887 (USNM; Ridgway 1888), 2 from 6 Feb. 1908 (BMNH; Lowe 1909 collected these and saw several flocks in clearings), and 3 from 14-22 March 1912 (MCZ; Paynter 1956).

Isla de Providencia - 1 spec. located, 5 March 1887 (FM; Cory 1887c, Hellmayr 1935). Bond and Meyer de Schauensee (1944) wrote that another spec. (not located) was collected in March 1941.

Isla San Andres - Sightings: 6 inds. in Dec. 1966 (Paulson et al. 1969) and 16 in April 1972 (Russell et al. 1979 incorrectly indicated that this represented a new island record). Bond (1980) noted the latter but not the former report.

Dendroica virens. Black-throated Green Warbler. This species has been noted as uncommon on the Caymans from Aug. to April (Bradley 1985).

Cayman Brac - Sighting, 19 Nov. 1973 (Patti et al. 1974).

Little Cayman - Listed by Bradley (1985).

Grand Cayman - Sightings: autumn 1956 (Bond 1957), and 17 Dec. (Bond 1970). Johnston et al. (1971) included the latter date in their note that this species is uncommon from Oct. to 25 April. Johnston (1975) later noted it from mangroves and limestone forest in April. Moore (1985) saw two in casuarinas and two in mangroves in Dec. 1981 and then considerably more birds in mangrove and scrub in late 1983.

Islas de Providencia and San Andres - Bond (1980) reported that Russell et al. (1979) had published records for both of these islands; that original publication, however, noted an observation of a bird on Providencia in April 1972, but made no mention of records for San Andres.

Dendroica fusca. Blackburnian Warbler. This species has been noted as an uncommon transient in the Caymans from Aug. to Dec. and again in April and May (Bradley 1985).

Cayman Brac - Sighting, 12-14 May 1986 (Norton 1986).

Little Cayman - Listed by Bradley (1985).

Grand Cayman - 1 spec., 11 April 1892 (FM; Cory 1892, Hellmayr 1935, Bond 1950b, Johnston et al. 1971). Johnston (1975), presumably on the basis of post-1971 observations, indicated that the bird is uncommon in sea grape-almond woodland in Dec.

Swan Islands - Sighting, on the beach, either 19 or 20 April 1929 (Fisher and Wetmore 1931).

Dendroica dominica. Yellow-throated Warbler. Bradley (1985) noted them as fairly common on the Caymans in mangroves and mixed woodland from Aug. to May.

Cayman Brac - 1 spec., 10 Sept. 1930 (USNM; not in literature). Sightings, Nov. and Dec. 1969 (Johnston et al. 1971).

Little Cayman - 6 specs.: 1 each on 9 and 10 Sept. 1886 (FM; Cory 1889, Hellmayr 1935), 1 ind. 1 Feb. 1904 (BMNH; this may be the spec. that Lowe 1911 claimed to possess), 2 from 13 Sept. 1930 (USNM; not in literature), and 1 from 24 Aug. 1961 (LSU; Johnston et al. 1971). Sightings, in mangroves, 26 July and 2 Aug. (Diamond 1980).

Grand Cayman - 7 specs.: 5 from 7-20 Aug. 1886 (FM; Cory 1886b), 1 from 23 March 1892 (also FM; Hellmayr 1935 noted all 6), and 1 from 25 Jan. 1904 (BMNH; not in literature). Johnston et al. (1971) reported the bird as uncommon from late summer to 29 Dec. The only individual that Olson et al. (1981) saw in their visit was a bird taking insects from the windows of a bank building in Georgetown. Johnston (1975) termed them uncommon in mangroves, and Bennett (1980) observed birds in mangroves in Jan. and Feb. 1975. Moore (1985) saw 3 in Dec. 1981 and a single bird in the same place in Dec. 1983.

Swan Islands - 2 spec.: 4 Feb. 1908 (BMNH; Lowe 1909 collected this and saw no others) and 29 Feb. 1912 (MCZ; Paynter 1956, referred to as D. dominica dominica by Monroe 1968).

Dendroica discolor. Prairie Warbler. Bradley (1985) indicated that it could be found in all habitats throughout the Caymans, with records stretching from July to mid-May.

Cayman Brac - 7 specs., from between 22 March and 6 April 1888 (FM; Cory 1889; Hellmayr 1935 noted only 6). Olson et al. (1981) saw 1 or 2 inds.

Little Cayman - 6 specs.: 2 inds. from 10 Sept. 1888 (FM; Cory 1889; Hellmayr 1935 noted only 1), 2 from 14 March 1904 (BMNH; not in literature), 1 from 13 Sept. 1930 (USNM; not in literature), and 1 from 24 Aug. 1961 (LSU; Johnston et al. 1971, Diamond 1980).

Grand Cayman - 4 specs. located: 16 Sept. 1930 (USNM; not in literature), 17 Aug. and 2 Sept. 1961 (LSU; not in literature), and 20 Nov. 1979 (USNM; Olson et al. 1981). In addition, Lowe (1911) reported "one or two examples" (not located). Johnston et al. (1971) considered it uncommon from 16 Aug.-3 March, and Johnston (1975) reported it as uncommon in mangroves but fairly common in mixed forest. Moore (1985) saw them fairly frequently in Bursera simaruba forests and less frequently in mangroves.

Swan Islands - 1 spec. located, 12 Feb. 1887 (USNM; Ridgway 1888, Ridgway 1902, Paynter 1956, Monroe 1968). Another spec. was captured at sea near the Swan Islands in early Sept. 1861 (Salvin and Godman 1881, not located).

Dendroica vitellina. Vitelline Warbler. This species is limited in distribution to the three Caymans and the two Swan Islands (American Ornithologists' Union 1983). There are three currently recognized subspecies, D. vitellina crawfordi from Cayman Brac and Little Cayman, D. vitellina vitellina on Grand Cayman, and D. vitellina nelsoni from the Swans. The species is similar to, and may be very closely related to, Dendroica discolor (Bond 1930, 1963). Lowery and Monroe (1968), however, felt that "lumping the two at this time seems premature." The Vitelline Warbler is a fairly common breeding resident on the three Caymans, especially in low scrub woodland habitat (Bradley 1985).

Cayman Brac - 72 specs. located: 31 from between 14 March and 7 April 1888 (26 in FM, 2 in MCZ, 2 in BMNH, 1 in AMNH; noted by Cory 1889 [as D. vitellina] and Hellmayr 1935), 1 ind. 31 Jan. 1904 (BMNH; Nicoll 1904b), 11 from 23 June to 9 July 1911 (10 in MCZ, one in UMMZ; included in total given by Bangs 1916; Bangs 1919 indicated that this series consisted of 14 specs.), 2 from 28 Feb. 1930 (Academy of Natural Sciences of Philadelphia [ANSP], not in literature), 5 from 10 and 11 Sept. 1930 (USNM; not in literature), 6 from 21-26 Aug. 1961 and 3 from 5 May 1970 (all LSU; not in literature), and 13 from 23-25 Nov. 1979 (USNM; Olson et al. 1981). Nicoll (1904b) examined the 1904 BMNH specimen and saw no difference between it and Little Cayman birds that he had previously described as D. crawfordi (Nicoll 1904a). Bangs (1916) designated this

population as a subspecies and first applied the name D. vitellina crawfordi. Olson et al. (1981) felt that this species was more abundant than any wintering woodland warbler species. Johnston (1975) said that they were common in limestone forest and uncommon in disturbed sites.

Little Cayman - 43 specs.: 1 from 10 Sept. 1886 and 7 from 20-26 April 1888 (all FM; Cory 1889, Hellmayr 1935), 2 on 14 March 1904 (BMNH; Nicoll 1904b), 2 on 27 Feb. 1905 (BMNH; probably those noted by Lowe 1909, 1911), 23 from 17-25 July 1911 (18 in MCZ, 3 in AMNH, 2 in CM; Bangs 1916, 1919), 3 from 8-13 Sept. 1930 and 1 on 5 Aug. 1979 (USNM; not in literature), and 4 from 21-24 Aug. 1961 (LSU; not in literature). Nicoll (1904a) described D. crawfordi and Lowe (1909, 1911) indicated that D. crawfordi was peculiar to Little Cayman. Bangs (1916) was the first to relegate the form to subspecific status. It has been reported as common in limestone forest (Johnston 1975) and as common throughout except in mangroves (Diamond 1980).

Grand Cayman - 82 specs.: 9 from 18-28 Aug. 1886 (FM; including the type for the species as described by Cory 1886a; also in Cory 1886b, Hellmayr 1935), 1 from 17 March 1887 (USNM; Ridgway 1888), 3 from 27 March-5 April 1892 (FM; not in literature), 10 from 18 March-17 April 1896 (7 in AMNH, 3 in ROM; not in literature), 2 inds. 28 Jan. 1904 (BMNH; not in literature), 1 on 12 March 1904 (BMNH; Nicoll 1904b), 1 on 12 Feb. 1908 (BMNH; not in literature), 10 from 16 April-22 May 1911 (MCZ; Bangs 1916, 1919), 2 from 4-5

March 1930 (ANSP; not in literature), 11 from 16-31 Aug. 1961 (10 at LSU, 1 at UMMZ; not in literature), 13 from 14 Feb.-11 April 1970 (LSU; not in literature), 4 from 5-8 April 1971 (ROM; not in literature), 4 from 29 April 1974 (ROM; not in literature), and 11 from 16-19 Nov. 1979 (USNM; not in literature). Savage English (1916) was the first to describe the nidification of this species. He found three nests in his garden in Georgetown, all located in shrubs 2-8 ft. above the ground and constructed, at least partially, of cotton (Gossypium). Egg-laying began on 22 April in one and terminated by 17 May in the latest, and clutches consisted of two eggs. Olson et al. (1981) felt that, in Nov. 1979, this species was "more abundant than any one of the wintering species of woodland warblers." Moore (1985) also saw them frequently, particularly in limestone forest. Bond (1930) described their habitat as dense scrub, Bennett (1980) saw them in scrub woodland, and Johnston (1975) found them to be common in various forest types and uncommon in disturbed sites.

Swan Islands - 70 specs. located: 9 from 2-12 Feb. 1887 (8 in USNM, 1 in AMNH; Ridgway 1888 indicated that this series originally consisted of 13 specs.), 13 from 20 Jan.-2 Feb. 1908 (BMNH; Lowe 1909), 25 from 10 Feb.-23 March and 12 more from 11 July 1912 (26 in MCZ, 3 in ANSP, and 2 each in BMNH, CM, FM [noted by Hellmayr 1935], and UMMZ; Bangs 1916), 3 from 19-20 April 1929 (USNM; Fisher and Wetmore 1931), 2 from 20-21 Oct. 1937 (BMNH; not in literature), 4

from 5 Jan. 1940 (FM; not in literature), and 2 from Feb. of an unspecified year (LSU; not in literature). Swan Island birds were not distinguished from those from the Caymans by Ridgway (1888) or Lowe (1909). Bangs (1919) used the series of 35 collected in 1912 to describe D. vitellina nelsoni. The Vitelline Warbler is the only breeding passerine on these islands (Paynter 1956). Birds occur on both Big Swan and Little Swan Islands (Monroe 1968), but may be more common on the latter (Bond 1950b).

Dendroica palmarum. Palm Warbler. Bradley (1985) considered this the most common wintering warbler in the Caymans.

Cayman Brac - 5 specs., from 19-30 March 1888 (FM; Cory 1889, Hellmayr 1935). Sighted in almost every possible habitat in mid-Nov. 1973 (Patti et al. 1974) and commonly in open areas and along roads in Nov. 1979 (Olson et al. 1981).

Little Cayman - 3 specs.: 1 each on 4 Feb. and 14 March 1904 and 27 Feb. 1905 (all BMNH; Lowe 1911 referred to some or all of these; Nicoll 1904b noted the March ind.). Cory (1889) listed it based upon the same expedition that visited Cayman Brac. However, neither Hellmayr (1935) nor I found any specimens in the FM. Diamond (1980) listed Cory's note as the sole record.

Grand Cayman - 3 specs.: 22 March 1892 (FM; Cory 1892, Hellmayr 1935), 18 March 1896 (AMNH; not in literature), and 28 Jan. 1904 (BMNH; Lowe 1911). Johnston et al. (1971)

considered them very common from Nov. to 9 April, and later specified pastures and cultivated areas, disturbed sites, and pure logwood forest as the most commonly used habitats, with sea grape-almond woodland, mangrove swamp, and mixed forest as somewhat less preferred (Johnston 1975). Olson et al. (1981) found them to be common in open areas and along roads, and Moore (1985) saw them almost everywhere except in thick, dry forest.

Swan Islands - 6 specs. located: 4 inds. from 3-25 Feb. 1887 (USNM; Ridgway 1888), and 1 each from 2 and 28 March 1912 (MCZ; Paynter 1956; Monroe 1968). Lowe (1909) reported having collected 2 inds. (not located).

Isla de Providencia - Cory (1887c) listed the bird and Hellmayr (1935) noted 1 spec. (not located). Bond and Meyer de Schauensee (1944) collected one in March 1941 (also not located). One or both of these references served as the basis for listing by Ridgway (1902), Bond (1950a, 1950b), and Bent (1953).

Isla San Andres - Sightings: Dec. 1966 (Paulson et al. 1969) and of 6 in April 1972 (Russell et al. 1979).

Dendroica castanea. Bay-breasted Warbler.

Cayman Brac - Sighting: 12-14 May 1986 (Norton 1986).

Little Cayman - Listed by Bradley (1985).

Grand Cayman - Sightings: Oct. 1956 (Bond 1957, Johnston et al. 1971), 2 May 1970 (Johnston et al. 1971), and 27 April 1974 (Barlow 1978).

Isla de Providencia - Although this species is listed on this island in the American Ornithologists' Union checklist (1983), I know of no specific records.

Isla San Andres - Bond (1950a) noted a male spec. collected on 22 April 1948 (not located). Sighting, Dec. 1966 (Paulson et al. 1969). Bond's checklist (1950b) included extreme dates from 28 Sept.-31 Oct. in the fall and from 20 April-5 May in the spring.

Dendroica striata. Blackpoll Warbler. A transient that is "most likely to be seen in the spring" (Bradley 1985).

Cayman Brac - Listed by Bradley (1985).

Little Cayman - 1 spec., 24 Aug. 1961 (LSU; Schwartz and Klinikowski 1963, Johnston et al. 1971, Diamond 1980).

Grand Cayman - 4 specs.: one each on 20 Sept. 1889 and 18 April 1892 (FM; Cory 1892, Hellmayr 1935, Johnston et al. 1971), 4 April 1896 (AMNH; not in literature), and 29 April 1974 (ROM; Barlow 1978). Barlow (1978) saw 5-10 daily from 23 April to 1 May 1974.

Isla de Providencia - Sighting, April 1972 (Russell et al. 1979, also in Bond 1980).

Isla San Andres - Sighting, April 1972 (Russell et al. 1979, also in Bond 1980).

Dendroica cerulea. Cerulean Warbler.

Grand Cayman - 1 spec. located, 7 Aug. 1886 (FM, Cory 1886b, 1892, and Hellmayr 1935). There may also be a 13 April 1970 spec. (Johnston et al. 1971, not located). Bond (1972), however, indicated that this had been a sight report rather than a collected bird. Moore's (1985) sight report in Dec. 1981, if accurate, would be very unusual. I know of no mid-winter records of this species from anywhere in the West Indies.

Cayos de Albuquerque - 1 spec. reported, 31 March 1941 (Bond and Meyer de Schauensee 1944, not located).

Mniotilta varia. Black-and-white Warbler.

Cayman Brac - Sightings: Nov.-Dec. 1969 (Johnston et al. 1979) and Nov. 1979 (Olson et al. 1981).

Little Cayman - 1 spec. located, 13 Sept. 1930 (USNM; not in literature). Lowe (1911) indicated that he had collected a specimen (not located, referred to by Diamond 1980).

Grand Cayman - 6 specs.: 4 from 7-24 Aug. 1886 (FM; Cory 1886b, 1892), 1 from 29 March 1892 (also FM; all 4 noted by Hellmayr 1935), and 1 from 18 March 1896 (AMNH; not in literature). Johnston et al. (1971) considered it fairly common from late summer to 12 May. Johnston (1975) identified its preferred habitat as sea grape-almond woodland and listed mangroves and various forest types as less commonly used. Olson et al. (1981) considered it one

of the two most frequently encountered non-resident warblers in woodlands. Moore (1985) saw it regularly in forests and less so in mangroves.

Swan Islands - 3 specs.: 1 on 28 March 1887 (USNM; Ridgway 1888 referred to this spec. and another dated 1 Feb. 1887) and 2 on 4 Feb. 1908 (BMNH; Lowe 1909 noted these and considered the species fairly abundant). Fisher and Wetmore (1931) wrote that they were not uncommon on 19 April 1929.

Isla de Providencia - 4 specs., all 9-18 March 1887 (FM; Hellmayr 1935). Sighting, April 1972 (Russell et al. 1979 claimed incorrectly that this was the first island record; also in Bond 1980).

Isla San Andres - 1 spec. located, 8 Feb. 1887 (FM; Cory 1887c, Hellmayr 1935). Bond and Meyer de Schauensee (1944) wrote that another spec. (not located) was collected on 29 March 1941. 4 sighted in Dec. 1966 and two in April 1967 (Paulson et al. 1969); 3 observed and 1 netted, April 1972 (Russell et al. 1979).

Setophaga ruticilla. American Redstart. This is the only warbler species reported from all seven islands.

Cayman Brac - 1 spec., 7 April 1888 (FM; Cory 1889, Hellmayr 1935). Sightings: Nov.-Dec. 1969 and 5 May 1970 (Johnston et al. 1971). Olson et al. (1981) considered this the commonest wintering warbler in woodlands.

Little Cayman - 1 spec. reported, 24 Aug. 1961 (Johnston et al. 1971, not located). Bradley (1985)

considered it fairly common in all habitats on this as well as the other two Caymans.

Grand Cayman - 5 specs.: 3 from 25 March-21 April 1892 (FM; Cory 1892; Hellmayr 1935 indicated that there were 4 in the FM), 1 each on 7 April 1971 and 28 April 1974 (ROM; not in literature). Johnston et al. (1971) indicated that this species is fairly common from 12 Dec. to 17 May. Johnston (1975) considered it common in mangroves, fairly common in sea grape-almond woodland, and uncommon in various forest types. Bennett (1980) studied foraging and other aspects of niche overlap between American Redstarts and other insectivorous passerines at two Grand Cayman study sites, one in mangroves and the other in secondary scrub woodland habitat. Olson et al. (1981) found them to be common in woodland, and Moore (1985) saw them on every visit to mangroves.

Swan Islands - 5 specs.: 1 each on 7 and 16 Feb. 1887 (USNM; Ridgway 1888), 4 Feb. 1908 (BMNH; Lowe 1909), and 29 Feb. 1912 and 9 Oct. 1926 (MCZ; Paynter 1956). Fisher and Wetmore (1931) noted that several were observed on 19 and 20 April 1929.

Isla de Providencia - Sighting, in April 1972 (Russell et al. 1979, also in Bond 1980). In April 1948, a female flew on board a ship 15 mi. north of Providencia (Bond 1950a).

Isla San Andres - Sightings: 23 April 1948 (Bond 1950a) and April 1972 (Russell et al. 1979).

Cayos de Albuquerque - 7 specs. were collected on 31 March 1941 (Bond and Meyer de Schauensee 1944; not located).

Protonotaria citrea. Prothonotary Warbler.

Cayman Brac - Sighting, 13 Oct. 1956 (Bond 1958, Schwartz and Klinikowski 1963, Johnston et al. 1971).

Little Cayman - 1 spec., 24 Aug. 1961 (LSU; Schwartz and Klinikowski 1963, Johnston et al. 1971, Diamond 1980).

Grand Cayman - Bond (1957) noted a sight report, but then wrote that previous records of this species from Grand Cayman had been erroneous (Bond 1958). Bradley (1985) listed the species, perhaps on the basis of subsequent unpublished sightings.

Isla de Providencia - Sighting, April 1972 (Russell et al. 1979).

Isla San Andres - Sightings: Dec. 1966 (Paulson et al. 1969), and April 1972 (Russell et al. 1979).

Cayos de Albuquerque - 1 spec., 31 March 1941 (ANSP; Bond and Meyer de Schauensee 1944).

Helmitheros vermivorus. Worm-eating Warbler. Bradley (1985) noted this as uncommon on the Caymans in dense black mangrove and buttonwood habitats.

Cayman Brac - 1 spec., 5 April 1888 (FM; Cory 1889; presumably the basis for listing by Ridgway 1902, Hellmayr 1935, Bond 1950b, and Johnston et al. 1971); 1 ind. mist-netted and photographed, 22 Nov. 1973 (Patti et al. 1974).

Little Cayman - Listed by Bradley (1985).

Grand Cayman - 2 specs.: 11 Feb. 1970 (LSU; Johnston et al. 1971), and 18 Nov. 1979 (USNM; Olson et al. 1981 netted a bird, presumably this spec., on that date). Johnston et al. (1971) considered this an uncommon species from Oct. to March 31 (repeated by Bond 1972). Johnston (1975) subsequently reported it as uncommon in pure logwood and mixed forest. Olson et al. (1981) netted birds on 17-18 Nov. 1979 and noted a Wetmore sight report from 28 Jan. 1972. Moore (1985) observed 4-6 inds. in Dec. of both 1981 and 1983.

Swan Islands - 1 spec. located, 6 Feb. 1908 (BMNH; Lowe 1909). Paynter (1956) indicated that Nelson had collected a specimen on 1 March 1912 (not located).

Isla de Providencia - 4 netted and a fifth sighted in April 1972 (Russell et al. 1979, also in Bond 1980).

Isla San Andres - 2 specs., 7 and 8 April 1972 (ROM); 3 inds. observed in Dec. 1966 (Paulson et al. 1969) and 1 netted in April 1972 (Russell et al. 1979; the 2 ROM specs. were presumably from this expedition).

Limnothlypis swainsonii. Swainson's Warbler.

Cayman Brac - Listed by Bradley (1985) without specific data.

Grand Cayman - Sightings of 3 inds., 16-17 Dec. 1969 (Bond 1970, Johnston et al. 1971).

Swan Islands - 1 spec., 1 March 1912 (MCZ; first referred to by Peters 1913 in an article otherwise concerned with Quintana Roo; subsequently noted by Hellmayr 1935, Bond 1950b, Bent 1953, Paynter 1956, Monroe 1968, and Meanley 1971).

Seiurus aurocapillus. Ovenbird.

Cayman Brac - 1 spec., 7 April 1888 (FM; Cory 1889, Hellmayr 1935, Johnston et al. 1971). Olson et al. (1981) commented that the species was present in low numbers in Nov. 1979.

Little Cayman - Lowe (1911) commented that "I have taken this bird on Little Cayman Island" (spec. not located). Johnston et al. (1971) and Diamond (1980) referred to this as the only island report.

Grand Cayman - 1 spec. located, 21 Nov. 1979 (USNM; not in literature). I do not know the basis upon which Cory (1892) listed this species. A 17 or 18 Dec. sighting by Johnston (in Bond 1970) was surely incorporated into the 16 Dec.-6 April date spread published by Johnston et al. (1971). It is uncommon in mangroves and pure logwood and mixed forests (Johnston 1975) and inhabits mixed woodland and mangroves, and, if there are rain pools present, logwood (Bradley 1985). Olson et al. (1981) reported 21 and 22 Nov. 1979 observations, and Moore (1985) saw 4 in Dec. 1981 and another in Dec. 1983.

Swan Islands - 5 specs.: 1 each on 24 Feb. 1887 (USNM; Ridgway 1888), 28 Feb. and 22 March 1912, 15 March 1927 (all in MCZ; Paynter 1956), and 20 Oct. 1937 (BMNH; not in literature). Sighting of "a few," 19 or 20 April 1929 (Fisher and Wetmore 1931).

Isla de Providencia - 1 spec. located, 5 March 1887 (FM; Cory 1887c, Hellmayr 1935). Another spec. was taken in March 1941 (Bond and Meyer de Schauensee 1944, not located). A bird was observed on Santa Catalina Island (an islet 100 m north of Providencia) on 2 May 1948 (Bond 1950a) and another netted on Providencia in April 1972 (Russell et al. 1979).

Isla San Andres - Sighting, of 15 inds. Dec. 1966 (Paulson et al. 1969); 5 netted and 3 seen in April 1972 (Russell et al. 1979).

Seiurus noveboracensis. Northern Waterthrush. It has been noted in mangrove swamps or vegetation associated with brackish ponds from July to May in the Caymans (Bradley 1985).

Cayman Brac - 4 specs., from 19 March-3 April 1888 (FM; Cory 1889, Hellmayr 1935).

Little Cayman - Listed by Bradley (1985).

Grand Cayman - 6 specs.: 3 from 1-20 Aug. 1886 (FM; Cory 1887a, cited in a note on a vireo from Grand Cayman, Hellmayr 1935; Lowe 1911 apparently was aware of only 1 of these specs.), and 1 each from 16 Nov. 1979 (USNM), 1 April 1896 (AMNH), and 27 April 1974 (ROM; none in literature).

Sightings: in mangroves, 16 April 1929 (Fisher and Wetmore 1931), uncommonly in mangroves from 21 Nov.-16 April (Johnston et al. 1971), 2 inds. netted and at least 2 others seen, Nov. 1979 (Olson et al. 1981), several seen in mangroves, Dec. 1983 (Moore 1985). Johnston (1975) noted the use of mangrove habitat, as well as pure logwood forest at times.

Swan Islands - 2 specs. located: 21 Feb. 1887 (USNM; Ridgway 1888) and 28 Sept. 1926 (MCZ; Paynter 1956). Ridgway (1888) also noted a 27 March 1887 spec. (not located).

Isla de Providencia - 7 specs. located, all from 7-18 May 1887 (FM; Cory 1887c, Hellmayr 1935). At least 1 spec. was collected in March 1941 (Bond and Meyer de Schauensee 1944, not located). Sightings: 2 inds. alongside a shallow pool, 24 April 1929 (Fisher and Wetmore 1931), many in mangrove swamps, May 1948 (Bond 1950a). 3 inds. netted, April 1972 (Russell et al. 1979).

Isla San Andres - 1 spec. located, 8 Feb. 1887 (FM; Cory 1887c, Hellmayr 1935). Bond and Meyer de Schauensee (1944) again refer to one or more specs. collected in March 1941 (not located). 2 inds. observed, Dec. 1966 (Paulson et al. 1969); 14 netted and 4 others sighted, April 1972 (Russell et al. 1979).

Seiurus motacilla. Louisiana Waterthrush.

Cayman Brac - 1 spec., 3 Aug. 1888 (FM; Hellmayr 1935, Johnston et al. 1971); sighting, 6 Dec. 1969 (Johnston et al. 1971).

Little Cayman - 1 ind. netted and banded, 30 July 1975 (Diamond 1980, also in Bond 1982).

Grand Cayman - 1 spec., 3 Aug. 1886 (FM; Cory 1886b, Hellmayr 1935, Bond 1950b, Johnston et al. 1971).

Swan Islands - 1 spec., 14 July 1912 (MCZ; Paynter 1956, Monroe 1968).

Isla de Providencia - 2 specs. located: 7 and 17 March 1887 (FM; Cory 1887c). Bond and Meyer de Schauensee (1944) noted another spec. taken in March 1941 (not located).

Oporornis formosus. Kentucky Warbler.

Little Cayman - Listed by Bradley (1985).

Grand Cayman - Sightings: 17 Dec. 1969 (Johnston et al. 1971, also in Bond 1970) and 28 Nov. (Norton 1984). Bradley (1985) wrote that the bird inhabits coastal woodlands and mangroves.

Isla de Providencia - 1 ind. netted, April 1972 (Russell et al. 1979, also in Bond 1980).

Geothlypis trichas. Common Yellowthroat.

Cayman Brac - 3 specs., from 31 March-6 April 1888 (FM; Hellmayr 1935, Johnston et al. 1971). Olson et al. (1981) considered the species uncommon in grassy areas.

Little Cayman - 1 spec., 4 Feb. 1904 (BMNH; not in literature). I have not located a spec. collected for Cory (1889; the only record noted by Diamond 1980). Bradley (1985) reported that the species is, at the very least, fairly common on all three of the Caymans in mangroves, scrub, and woodland near fresh or brackish water.

Grand Cayman - Listed by Cory (1892); Hellmayr (1935) noted a spec. (not located). Sighted in April 1966 (by Johnston, in Bond 1968); Johnston et al. (1971) considered the bird common 21 Nov.-14 May. It has been noted as common in pure logwood and mixed forests and uncommon in sea grape-almond woodland and mangroves (Johnston 1975). Olson et al. (1981) saw it infrequently in grassy areas, and Moore (1985) saw it on many occasions.

Swan Islands - 2 specs.: 12 Feb. 1887 (USNM; Ridgway 1888, 1902, and Paynter 1956) and 4 Feb. 1908 (BMNH; Lowe 1909 collected this and observed a "fair number"; also in Lowe 1911). Sighting, in a thicket, 19 or 20 April 1929 (Fisher and Wetmore 1931).

Isla San Andres - Sightings: 24 April 1948 (Bond 1950a), Dec. 1966 (Paulson et al. 1969), and April 1972 (Russell et al. 1979).

Cayos de Albuquerque - Bond and Meyer de Schauensee (1944) reported a 31 March 1941 spec. (not located).

Wilsonia citrina. Hooded Warbler.

Swan Islands - 1 spec., 25 March 1927 (MCZ; Paynter 1956, Bond 1957, Monroe 1968).

Isla San Andres - 2 sightings and 1 ind. netted in April 1972 (Russell et al. 1979; also in Bond 1980).

Icteria virens. Yellow-breasted Chat.

Grand Cayman - Olson et al. (1981) indicated that Alexander Wetmore had observed an ind. at the edge of a thicket on 14 Feb. 1973, and further noted that "it is unlikely that someone with as many years field experience as Wetmore would mistake such a distinctive species." Moore (1985) concurred, but noted that Wetmore, curiously for such an unusual sighting, "makes no mention of this observation in his journal notes."

DISCUSSION

There are two permanent resident warblers in the western Caribbean, Dendroica petechia on the Caymans, Providencia, and San Andres, and D. vitellina on the Caymans and Swan Islands. The numbers of species, exclusive of breeding residents, can be broken down by island (see Table 2). Specimens that I have located substantiate claims for 22 of the 28 migrant species reported from the region. Of the remaining six species, there is a specimen of one (D.

Table 2. The number of warbler species reported for each island or island group and the type of evidence supporting each report.

	Total	Located Specimen	Unlocated Specimen	Netted	Sight Report
Cayman Brac	22	10	-	1	11
Little Cayman	22	7	3	1	11
Grand Cayman	26	16	1	-	9
Swan Islands	17	16	-	-	1
Providencia	15	6	2	2	5
San Andres	18	5	1	5	7
Albuquerque	5	1	4	-	-

castanea) mentioned in the literature that I have not seen, and there is a mist-net record for Oporornis formosus. The other four are included on the basis of sight reports.

There are 14 migrant species that should be considered at least fairly regular winter residents on at least some of these islands (Parula americana, Dendroica tigrina, D. caerulescens, D. coronata (very irregularly), D. virens, D. dominica, D. discolor, D. palmarum, Mniotilta varia, Setophaga ruticilla, Helmitheros vermivorus, Seiurus aurocapillus, S. noveboracensis, and Geothlypis trichas). Dendroica magnolia, Protonotaria citrea, and Oporornis formosus occur infrequently and irregularly. Two other species (Dendroica castanea and D. striata) are fairly regular transients during migration. Seiurus motacilla and perhaps Vermivora peregrina could be thought of as irregular transients, and three others (Dendroica fusca, D. cerulea, and Wilsonia citrina) are even more accidental during migration periods. The four remaining species (Vermivora pinus, Dendroica pensylvanica, Limnothlypis swainsonii, and Icteria virens) should be considered at best accidental.

LITERATURE CITED

- American Ornithologists' Union. 1983. Check-list of North American birds. 6th ed. American Ornithologists' Union. Washington, D.C. 877 p.
- Bangs, O. 1916. A collection of birds from the Cayman Islands. Bull. Mus. Comp. Zool. 60:301-320.
- _____. 1919. The races of Dendroica vitellina Cory. Bull. Mus. Comp. Zool. 62:491-495.
- Barlow, J. C. 1978. Records of migrants from Grand Cayman Island. Bull. Brit. Ornithol. Club 98:144-146.
- Bennett, S. E. 1980. Interspecific competition and the niche of the American Redstart (Setophaga ruticilla) in wintering and breeding communities. P. 319-336 in A. Keast and E. S. Morton, eds., Migrant birds in the Neotropics. Smithsonian Inst., Washington, D.C.
- Bent, A. C. 1953. Life histories of North American wood warblers. Bull. U.S. Nat. Mus. 203:1-734.
- Bond, J. 1930. The resident West Indian warblers of the genus Dendroica. Proc. Acad. Nat. Sci. Philadelphia 82:329-337.
- _____. 1950a. Results of the Catherwood-Caplin West Indies Expedition, 1948. Part 2: Birds of Cayo Largo (Cuba), San Andres and Providencia. Proc. Acad. Nat. Sci. Philadelphia 102:43-68.
- _____. 1950b. Check-list of birds of the West Indies. 3rd ed. Wickersham Printing Co., Lancaster, Pa. 200 p.

- _____. 1957. Second supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 14 p.
- _____. 1958. Third supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 11 p.
- _____. 1963. Eighth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 11 p.
- _____. 1968. Thirteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 12 p.
- _____. 1970. Fifteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 15 p.
- _____. 1972. Seventeenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 11 p.
- _____. 1980. Twenty-third supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 14 p.
- _____. 1982. Twenty-fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 16 p.
- _____ and R. Meyer de Schauensee. 1944. Results of the Fifth George Vanderbilt Expedition (1941). The birds. Monogr. Acad. Nat. Sci. Philadelphia 6:7-56.

Bradley, P. 1985. Birds of the Cayman Islands. P. E.

Bradley, Georgetown, Cayman Islands, B.W.I. 245 p.

Cory, C. B. 1886a. Descriptions of thirteen new species of birds from the island of Grand Cayman, West Indies. Auk 3:497-501.

_____. 1886b. A list of the birds collected in the island of Grand Cayman, West Indies, by W. B. Richardson, during the summer of 1886. Auk 3:501-502.

_____. 1887a. A new vireo from Grand Cayman, West Indies. Auk 4:6-7.

_____. 1887b. Descriptions of six supposed new species of birds from the islands of Old Providence and St. Andrews, Caribbean Sea. Auk 4:177-180.

_____. 1887c. A list of the birds taken by Mr. Robert Henderson, in the islands of Old Providence and St. Andrews, Caribbean Sea, during the winter of 1886-87. Auk 4:180-181.

_____. 1889. A list of the birds collected by Mr. C. J. Maynard in the islands of Little Cayman and Cayman Brack, West Indies. Auk 6:30-32.

_____. 1892. Catalogue of West Indian birds, containing a list of all species known to occur in the Bahama Islands, the Greater Antilles, the Caymans, and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Published by the author, Boston. 163 p.

- Diamond, A. W. 1980. Ecology and species turnover of the birds of Little Cayman. *Atoll Research Bull.* 241:141-164.
- Fisher, A. K. and A. Wetmore. 1931. Report on birds recorded by the Pinchot expedition of 1929 to the Caribbean and Pacific. *Proc. U.S. Nat. Mus.* 79(10):1-66.
- Greenway, J., Jr. 1933. A new name for the Golden Warbler of Old Providence Island. *Proc. New England Zool. Club* 13:63-64.
- Hellmayr, C. E. 1935. Catalogue of birds of the Americas and adjacent islands. *Field Mus. Nat. Hist., Zool. Ser.* 13:Part 8:1-541.
- Johnston, D. W. 1975. Ecological analysis of the Cayman Islands avifauna. *Bull. Fla. St. Mus. Bio. Sci.* 19:235-300.
- _____, C. H. Blake, and D. W. Buden. 1971. Avifauna of the Cayman Islands. *Quart. J. Fla. Acad. Sci.* 34:141-156.
- Lowe, P. R. 1909. Notes on some birds collected during a cruise in the Caribbean Sea. *Ibis* 1909:304-347.
- _____. 1911. On the birds of the Cayman Islands, West Indies. *Ibis* 1911:137-161.
- Lowery, G. H., Jr. and B. L. Monroe, Jr. 1968. Family Parulidae. P. 3-93 in R. A. Paynter, Jr., ed., *Checklist of birds of the world*, vol. 14. Harvard Univ. Press, Cambridge, Mass.

- Meanley, B. 1971. Natural history of the Swainson's Warbler. North Amer. Fauna, no. 69. Bureau of Sport Fish. and Wildl., U.S. Dept. Interior. 90 p.
- Monroe, B. L., Jr. 1968. A distributional survey of the birds of Honduras. Ornithol. Monogr. 7:1-458.
- Moore, A. G. 1985. Winter status of birds on Grand Cayman Island. Bull. Brit. Ornithol. Club 105:8-17.
- Nicoll, M. J. 1904a. Mr. M. J. Nicoll exhibited and made remarks on some interesting birds met with by him during the recent voyage of the 'Valhalla'. Bull. Brit. Ornithol. Club 14:94-96.
- _____. 1904b. On a collection of birds made during the cruise of the 'Valhalla', R.Y.S., in the West Indies (1903-4). Ibis 1904:555-591.
- Norton, R. L. 1984. The autumn migration: West Indies region. Amer. Birds 38:251-253.
- _____. 1986. The spring migration: West Indies region. Amer. Birds 40:528-529.
- Olson, S. L., H. F. James, and C. A. Meister. 1981. Winter field notes and specimen weights of Cayman Island birds. Bull. Brit. Ornithol. Club 101:339-346.
- Pashley, D. N. and R. P. Martin. 1988. The contribution of Christmas Bird Counts to knowledge of the winter distribution of migratory warblers in the Neotropics. Amer. Birds 42:1164-1176.

- Patti, S. T., D. I. Rubinstein, and N. Rubinstein. 1974.
Distributional notes on the birds of Cayman Brac.
Quart. J. Fla. Acad. Sci. 37:155-156.
- Paulson, D. R., G. H. Orians, and C. F. Leck. 1969. Notes
on birds of Isla San Andres. Auk 86:755-758.
- Paynter, R. A., Jr. 1956. Birds of the Swan Islands.
Wilson Bull. 68:103-110.
- Peters, J. L. 1913. List of birds collected in the
territory of Quintana Roo, Mexico, in the winter and
spring of 1912. Auk 30:367-380.
- _____. 1927. A revision of the Golden Warblers, Dendroica
petechia (Linne). Proc. Biol. Soc. Wash. 40:31-41.
- Ridgway, R. 1888. Catalogue of a collection of birds made
by Mr. Chas. H. Townsend, on islands in the Caribbean
Sea and in Honduras. Proc. U.S. Nat. Mus. 10(665):572-
597.
- _____. 1902. The birds of North and Middle America. Part
II. Bull. U.S. Nat. Mus. 50:1-834.
- Russell, S. M., J. C. Barlow, and D. W. Lamm. 1979. Status
of some birds on Isla San Andres and Isla Providencia,
Colombia. Condor 81:98-100.
- Salvin, O. and F. D. Godman. 1881. Biologia Centrali-
Americana. Aves. Vol. I.
- Savage English, T. M. 1916. Notes on some of the birds of
Grand Cayman, West Indies. Ibis 1916:17-35.

Schwartz, A. and R. F. Klinikowski. 1963. Observations on
West Indian birds. Proc. Acad. Nat. Sci. Philadelphia
115:53-77.

WARBLERS OF THE WEST INDIES

III. THE LESSER ANTILLES

This is the third in a series of papers summarizing the distribution, seasonality, habitat use, and other published data on warblers of the West Indies. Specimens housed in 37 museum collections have served as the principal data source. This information has been supplemented by the published literature. Published sight reports, although certainly less reliable than specimens, also have been included, but unpublished personal communications of sightings have not.

For the purposes of this paper, the Lesser Antilles consist of those islands from Sombrero on the north through Grenada on the south (Figure 1). Within each species account, islands are treated from north to south. Those islands lying north of and roughly parallel to the coast of South America will be subjects of separate papers.

For the sake of brevity, abbreviations will be used for specimen(s) (spec.[s]), individual(s) (ind.[s]), literature (lit.), and museums (full name and abbreviation used at first mention of each institution).

SOMBRERO

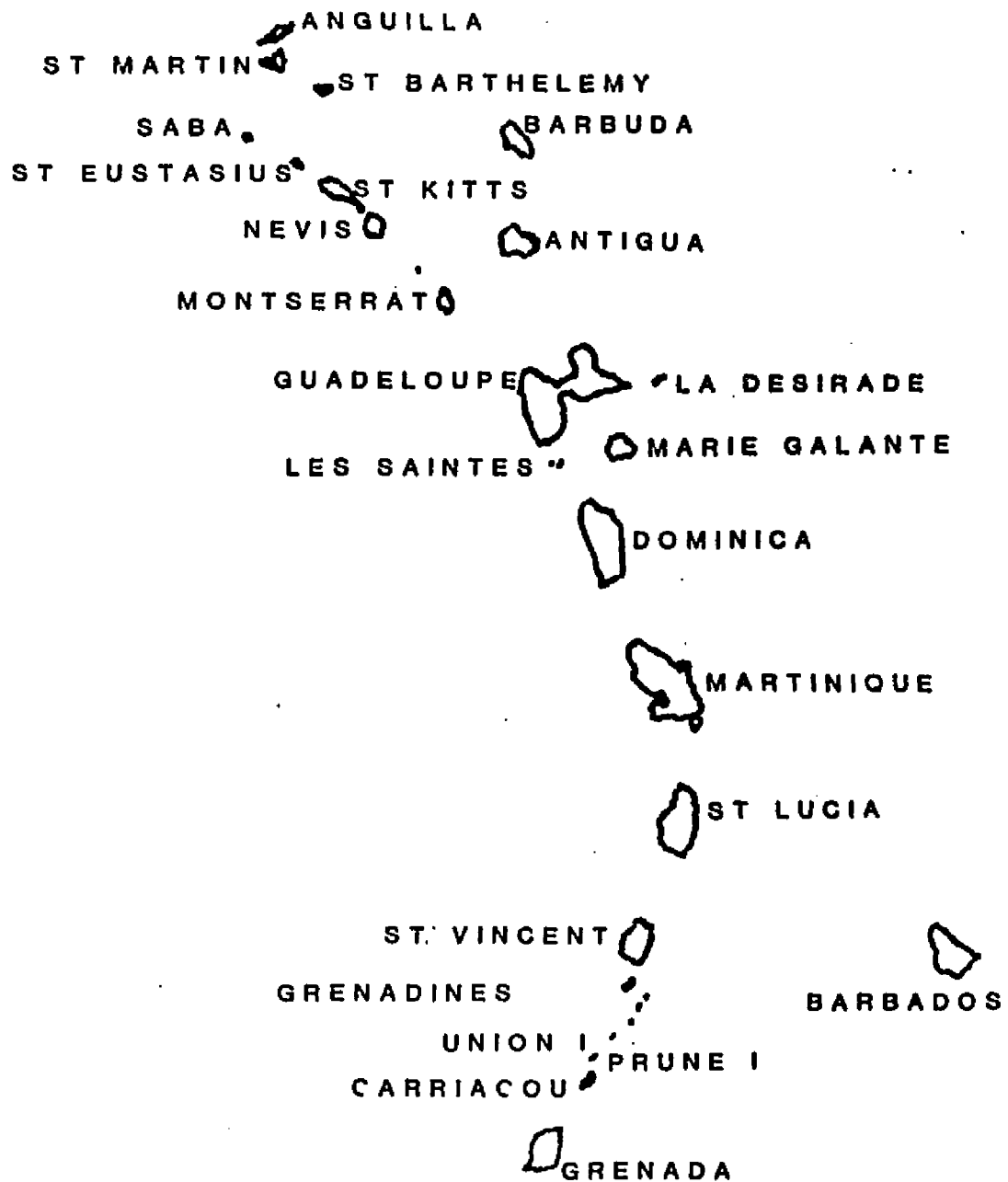


Figure 1. Map of the Lesser Antilles, including all islands considered in the text.

SPECIES ACCOUNTS

Vermivora peregrina. Tennessee Warbler. Hypothetical.

Barbados - Sighting, 23 May (Bond 1977).

Parula americana. Northern Parula.

Anguilla - 1 spec., 11 Feb. 1922 (Museum of Comparative Zoology, Harvard [MCZ]; Peters 1927b referred to this spec. and also saw 2 or 3 others on that date).

St. Martin - 4 specs.: 22 Dec. 1927 (United States National Museum [USNM]; Danforth 1930 referred to this spec. and also observed other inds. on that date), 2 inds. on 6 and another on 9 Feb. 1952, (Zoologisch Museum Amsterdam [ZMA]; Voous 1955, from dry scrub). Sightings: Feb. and 19 April 1973 (Hoogerwerf 1977; according to Voous 1983, the latter is the latest reported date) and 2 Sept. 1957 (Voous 1983 referred to this as the earliest date).

St. Barthelemew - 2 specs., both 12 Nov. 1890 (Field Museum of Natural History [FM]; Cory 1892 and Bond 1950 presumably referred to these specs.).

Barbuda - 2 specs., both 23 Jan. 1983 (USNM; not in lit.); sighting, 30 March 1962 (Schwartz and Klinikowski 1963).

Saba - 3 specs. located: 27 Jan. 1937 (USNM; Danforth 1938), 3 March 1952 (ZMA; Voous 1955), and 1 undated (USNM; perhaps either the Ober spec. noted by Voous 1955 or the Winch spec. noted by Cory 1892; 1 or both of these has not

been located). The latest observation date is 23 March 1955 (Voous and Koelers 1967).

St. Eustasius - 5 specs.: 4 from 21-30 March 1890 (3 in FM [Cory 1891a, Hellmayr 1935] and 1 in the British Museum [Natural History] [BMNH]) and 1 from 21 Feb. 1922 (MCZ; not in lit.).

St. Kitts - 9 specs. located: 2 from 5 Jan. 1888 and 1 each from 1 and 9 March 1890 (all FM; Cory 1892, Danforth 1936, Hellmayr 1935), 13 Feb. 1904 (BMNH; Nicoll 1904 collected this and considered the species very numerous), 20 March 1922 (MCZ; not in lit.), 16 April 1962 (Louisiana State University Museum of Zoology [LSU]; not in lit.), and 12 and 19 Feb. 1982 (USNM; not in lit.).

Nevis - Sighting, 24 April 1962 (Schwartz and Klinikowski 1963).

Antigua - Listed by Cory (1892) and Holland and Williams (1978; described as the second most common winter warbler on the island).

Montserrat - 4 specs. located: 1 each from 9 April 1962 (LSU) and 26 Jan. 1983 (USNM; neither in lit.), and 2 on 11 Feb. 1904 (BMNH; Nicoll 1904 collected these and commented that this species was "fairly numerous in the thick bushes along the shore"). Sightings, 7-8 Feb. 1937 (Danforth 1939b).

Guadeloupe - 2 specs., both undated (American Museum of Natural History [AMNH]; not in lit.). Lawrence (1886) and

Danforth (1939a) quoted Dr. Colardeau, who considered the bird "not plentiful" from Dec. to March.

Dominica - 2 specs.: 22 Feb. 1962 (LSU; Schwartz and Klinikowski 1963) and 2 April 1964 (USNM; not in lit.).

Martinique - 1 spec., 11 Feb. 1962 (LSU; Schwartz and Klinikowski 1963, Pinchon 1963).

St. Lucia - 1 spec., 2 Jan. 1962 (LSU; Schwartz and Klinikowski 1963).

Barbados - Feilden (1889) observed a bird in a garden on 4 Nov. 1888 and was given a "mounted specimen" supposedly shot in June (Clark 1905b repeated this information). Bond (1959 and 1962) reported Feb. sightings by M. B. Hutt.

St. Vincent - 1 spec., 28 Dec. 1961 (LSU; Schwartz and Klinikowski 1963).

Grenada - Sighting, 6 Dec. 1961 (Schwartz and Klinikowski 1963).

Dendroica petechia. Yellow Warbler. This species presents a bewildering array of taxonomic problems. The 37 currently recognized subspecies (34 in Lowery and Monroe 1968 and 3 others described by Olson 1980) breed from Alaska south to Peru and the Galapagos. Many of these were initially described as new species and, even after considerable consolidation, the group had been divided into the yellow-headed birds breeding on the continent from Alaska to south-central Mexico (Yellow Warblers, D. aestiva), the more-or-less chestnut-capped birds (referring to adult males) of the

West Indies, the Pacific coast of South America, and the Galapagos and Cocos Islands (Golden Warblers, D. petechia), and the chestnut-hooded birds of both coasts of Mexico, Central America, the Caribbean coast of South America, and Martinique (Mangrove Warblers, D. erithachorides). Hellmayr (1935) lumped the Golden and the Mangrove groups, and Aldrich (1942) lumped the Yellow with the Golden group. There are 6 resident subspecies in the Lesser Antilles. There are also a few records of migrant Yellow types on some of the southernmost islands of the chain. The main reason that the taxonomic history of Lesser Antillean birds is difficult to unravel, other than the complicated nature of the species in general, has been confusion concerning the type localities of the nominate subspecies (now known to be from Barbados) and of the Martinique subspecies (D. p. ruficapilla).

D. petechia bartholemica. This subspecies is resident from Anguilla south to Montserrat. It is replaced to the west by D. p. cruciana in the Virgin Islands, and is absent on Saba, which now lacks breeding Yellow Warblers. In much of the earlier lit., the name ruficapilla was applied to many of these birds (see discussion under that Martinique subspecies). Peters (1927a) indicated that this form is found in mangroves as well as in scrub growth and near habitations. Bond (1930) noted it in open scrub, second growth, and plantations on most of the islands.

Anguilla - 12 specs.: 2 from 28 March 1892 (BMNH; Sclater 1892 noted these as the first island record), 7 from Feb. 1922 (MCZ; Peters 1927a mentioned 4 of these and considered the birds common in practically all habitats on the island, including mangroves and brushy thickets; Peters 1927b noted all 7), and 3 from May 1962 (LSU; not in lit.).

St. Martin - 8 specs.: 1 each from Feb. 1895 (AMNH; not in lit.), Dec. 1927 (Academy of Natural Sciences of Philadelphia [ANSP]; Danforth 1930 collected this and considered the birds scarce), and Sept. 1952 (ZMA; Voous 1955), and 5 from May 1962 (LSU; not in lit.). Bond (1965) noted the observation of an ind. during 1965. Voous and Koelers (1967) considered it less numerous on St. Martin than on St. Eustasius. Hoogerwerf (1977) saw birds fairly regularly in low shrubs. Voous (1983) wrote that it is almost restricted to rhizophore mangrove and littoral vegetation of sea-grape.

St. Barthelemy - According to Ridgway (1902), Sundevall described this subspecies in 1870 on the basis of a specimen in the Stockholm Museum collected on St. Barthelemy (however, ruficapilla was thought to have precedence over bartholemica for quite some time). I have seen neither the original publication nor the specimen, although there is a BMNH 1870 skin that was almost surely collected with the type. There are 3 additional specs.: 2 from Nov. 1890 (FM; Cory 1892, Hellmayr 1935) and 1 undated (USNM; not in lit.).

Barbuda - Lawrence (1878c) indicated that Ober had collected a spec. (not located). This served as the basis for listing by Cory (1886a, 1892) and Ridgway (1902; here placed in the subspecies bartholemica). 5 specs. collected in 1903 (USNM) were felt by Riley (1904) to be distinct (along with Antigua specs.) from Puerto Rican and Virgin Island birds that Ridgway had included in bartholemica. Riley's split of the western birds into cruciana left bartholemica applicable to the island populations that remain ascribed to it today. Danforth (1935b) described it as a common resident in mangroves and xerophytic brush and noted 2 1933 specs. (USNM), the stomachs of which contained insect material. 3 birds collected in 1962 (LSU) and 4 in 1983 (USNM) bring the total number of specs. to 14.

St. Eustasius - 35 specs.: 17 from 1890 (13 in FM [Cory 1891a, Hellmayr 1935] and 4 in BMNH), 10 from Feb. 1922 (9 in MCZ and 1 in the Carnegie Museum of Natural History [CM]; these were surely the specs. examined by Peters 1927a), 6 from Feb. 1952 (ZMA; Voous 1955), and 2 from April 1962 (LSU; not in lit.). Danforth (1930) considered the bird scarce and observed only 1 ind. in scrubby brush during his visit. Voous (1955), however, considered it common and observed it all over the island. Voous and Koelers (1967) and Voous (1983) called it rather common, with low scrub as preferred habitat.

St. Kitts - 51 specs.: 14 from 1888 and 1890 (13 in the FM; Cory 1891b; Hellmayr 1935 indicated that there were 14

in that collection; and 1 in BMNH), 1 from Feb. 1894 and 4 from 13 Feb. 1904 (all BMNH; Nicoll 1904 collected the latter series and described the bird as "very common amongst the thick bushes on the shore"), 3 undated specs. (MCZ) that may have been collected along with 10 specs. dated from March 1922 (9 in MCZ and 1 in CM; these were among the 11 inspected by Peters 1927a), 2 from 1931 and 2 from 1935 (USNM; Danforth 1936 noted collecting 4 specs., surely including the latter and perhaps all 4), 10 from 1962 (LSU; not in lit.), and 5 from 1982 (USNM; not in lit.). Danforth (1936) collected a nest made primarily of dried grasses with 2 young and an unhatched egg on 28 June 1935. Morris and Lemon (1985) found it to be an abundant species in surveys of coastal scrub from 14-28 April 1982.

Nevis - Peters (1927a), with the mention of 3 specs. (MCZ), was the first to comment on this bird from Nevis. Danforth (1936) considered it common in mangroves, arid scrub, and second growth and collected 1 spec. (USNM), the stomach of which contained Coleoptera and other insects. The 12 specs. that I have located also include 4 each in the USNM and LSU that are not in the lit.

Antigua - The first report from this island was in the catalog of a collection by Ober, who considered the species rare (Lawrence 1878c). The only specimens among the 69 that I have located that could be Ober's are an undated pair in the USNM. Additionally, there are 8 from 1890 (5 in the FM noted by Cory 1891a and Hellmayr 1935 and 3 in the BMNH), 1

from 1892 (BMNH), a series of 17 from late 1903 (7 in the USNM were noted by Riley 1904; also 7 in AMNH, 2 in BMNH, and 1 at Cornell University), 2 from 1904 (BMNH; Nicoll 1904), 2 from 1914 (MCZ; not in lit.), 3 in July 1933 (USNM; Danforth 1934), 23 collected in 1962 and 1963 (19 now at LSU, 1 each at the Peabody Museum at Yale University [PM] and the Los Angeles County Museum of Natural History [LACM], and 2 at the University of Michigan Museum of Zoology [UMMZ]), and a series of 11 taken in 1980 (USNM). Danforth (1934) considered it a very common resident in mangroves and xerophytic brush and observed birds not only on Antigua but on 4 small adjacent islands. Holland and Williams (1978) called it a common resident.

Montserrat - The first specimens from this island were 4 collected by Nicoll (1904) on 11 Feb. 1904 (BMNH) that he referred to as D. ruficapilla. The placement of Montserrat birds in bartholemica by Bond (1930) was followed by Hellmayr (1935) and Bond (1939b). The latter article also referred to 2 specs. deposited in the ANSP (not located). Bond (1930) wrote that, of the islands on which this subspecies occurs, Montserrat is the only one on which it is confined to mangrove swamps. However, Danforth (1939b) collected 2 specs. (now in USNM) in dry scrub and saw them in manchineels along the coast as well. 1 USNM and 2 LSU specs. (not in lit.) bring the total number to 9.

D. petechia melanoptera. This subspecies occurs from Guadeloupe south through Dominica.

Guadeloupe - Lawrence (1879b) described the subspecies on the basis of specs. collected for him on Guadeloupe by Ober (1 undated BMNH spec. was definitely taken at that time; 6 undated AMNH specs. may also have been collected by Ober; Ober considered the birds common in gardens and coffee plantations). The total of 72 specs. also includes 1 from 15 Feb. 1886 (FM; Cory 1886b), a series of 25 from Sept. 1890 (22 in the FM; Cory 1891b; Hellmayr 1935 referred to 35 FM specs.; and 3 in the BMNH), 4 from early 1902 (AMNH; not in lit.), 15 labelled July and Sept. 1914 (MCZ; Noble 1916 indicated that he had collected these in July and Aug., and that the birds were common in lowland hot scrubby fields and mangroves), 8 from June and July 1937 (USNM; Danforth 1939a collected these and considered the bird "very common in the lowlands, in clearings, scrub country, and mangrove swamps, but never seen in the woods"), 1 from Aug. 1950 (AMNH; not in lit.), and a series of 11 from Feb. 1963 (LSU; not in lit.). Terborgh et al. (1978) mist-netted birds in coastal scrub.

La Desirade - Bond (1930), the first to include this bird in the island's avifauna, called it "rather rare." Danforth (1939a) wrote that it was common near the coast, and collected the only specimen of which I am aware on 9 July 1937 (USNM). Terborgh et al. (1978) captured inds. in mist-nets.

Iles des Saintes - Bond (1930) tentatively listed the species from these islands. There are 7 specs.: 1 from 5 March 1932 (ANSP; not in lit.), 1 from 5 July 1937 (USNM; Danforth 1939a confirmed the birds' presence on the basis of this and a second spec. that I have not located; he found them to be common on both Terre-de-Bas and Terre-de-Haut), and 5 from Feb. 1963 (LSU; not in lit.). Vaurie (1961) considered it "common throughout but more so near the shore in bushes and especially manchineel trees." Bond (1965) observed birds on Ilet-a-Cabrit in Jan. 1965 and Terborgh et al. (1978) netted them on both Terre-de-Bas and Terre-de-Haut.

Marie Galante - 6 specs.: 4 from Feb. 1886 (FM; noted by Cory 1886b, Hellmayr 1935, and Bond 1930, who wrote that the status of the species on the island was unknown at that time), 1 on 18 July 1977 (USNM; Danforth 1939 commented that the birds were abundant and that the stomach of the specimen collected was 95% full of "fleabeetles"), and 1 from 1 March 1963 (LSU; not in lit.). Terborgh et al. (1978) mist-netted birds in coastal scrub.

Dominica - The 2 earliest specs., dated April 1863 (BMNH) were the evidence upon which Taylor (1864), in the first island report, wrote that Yellow Warblers were common on Dominica. The next description, by Lawrence (1878a), was based on a collecting trip by Ober. Ober collected a spec. on 21 March 1877 (probably an undated skin in the AMNH), described a nest containing 3 eggs that he found in April,

and considered the birds "abundant on the plantations of the east coast." Sharpe (1885) examined another Ober spec. (BMNH) from 1879 and felt that it belonged in the species D. melanoptera. Sclater (1889a) noted that 1 or more additional specs. had been sent to Britain by Ramage. Verrill (1892) based his decision to reduce the population's status to that of a subspecies upon 4 specs. from 1890 now in the PM. He considered the birds abundant in low, open woods and described 2 nests found in April (one containing 2 fresh eggs and the other 3; another nest situated 10 ft above the ground was located by Bond 1941 in early May 1935). Nicoll (1904) collected 3 specs. (BMNH) in Feb. 1904 and considered the bird "fairly numerous." The species has also been called "abundant in second growth" by Bond (1928), who collected 3 specs. that I have not located. Many of the 88 specs. that I have located are not in the lit. Including those in the above text, they are located in the BMNH (18), AMNH (15), PM (15), LSU (13), FM (9; Hellmayr 1935 noted 3), MCZ (4), USNM (4), ZMA (4), UMMZ (2), and 1 each in the CM, Cornell, Delaware Natural History Museum [DNHM], and LACM.

D. petechia ruficapilla. The nomenclatural history of this subspecies, limited in distribution to Martinique, is particularly confusing. The name ruficapilla was used for Martinique birds in 1760, but, as Sharpe (1885) put it, "it is almost impossible to make out this description." In any case, it was thought that it could not apply to Martinique

birds because they were of an extreme rufous coloration typical of the Mangrove Warbler group ("D. erithachorides") and quite unlike the less rufous Golden Warblers of the islands to the north and south of Martinique that appeared to be the subjects of the 1760 description. Sharpe (1885) applied the name ruficapilla to birds from the Virgin Islands and northern Lesser Antilles that would eventually be called, respectively, cruciana and bartholemica (this treatment was followed by many early collectors and writers). For birds from Martinique, the term that came into use was D. rufigula. As Lawrence (1878d) explained, this name was erected by Baird in 1865 when it was thought that Martinique birds could not be called ruficapilla. Ridgway (1902) followed this reasoning, calling Martinique birds D. rufigula, and using D. ruficapilla as the specific name for several of the Golden Warblers. In 1935, Hellmayr decided that the initial 1760 description of ruficapilla could apply very well to females from Martinique, and that the original locality was not necessarily in error. Bond (1939a) appeared to be convinced by Hellmayr's logic but still used the name rufigula. By 1950, however, Bond used ruficapilla for Martinique birds. As a result of this change, rufigula has fallen into disuse, and another name (bartholemica) has been applied to the northern Lesser Antillean birds.

I have located 76 specs. at the MCZ (24), LSU (22), FM (9; noted by Cory 1886a and Hellmayr 1935), AMNH (6), ANSP

(5), USNM (3), BMNH (2; noted by Lawrence 1878d and Sharpe 1885), UMMZ (2), CM (2), and LACM (1). Schreiber and Schreiber (1984) captured 1 bird in xeric hill habitat for which they provided mensural data. Lawrence (1878d) wrote that Ober had found the bird "generally distributed throughout the island." Bond (1930) commented that the bird occurs in mangroves, scrub, and plantations, and was one of the few birds that could at that time be called even fairly common on Martinique, as most other species had been decimated by the mongoose and native hunters. The population may have declined since then due to cowbird parasitism and mangrove destruction, and may now number between 1000 and 2000 pairs (N. Klein, pers. comm.).

D. petechia babad. This subspecies is limited in distribution to St. Lucia. In describing it, Bond (1927) commented that because it was common, though local, at different points on the island, it was hard to explain how it had been previously overlooked (Bond collected 2 specs. that I have not located). There actually is a spec. from St. Lucia in the MCZ that, although undated, could be considerably older on the basis of catalog number (this is not a safe assumption, however, considering some numbering peculiarities in the MCZ collection). Bond (1928) specified the localities in which the bird could be found and noted a nest found on 16 March. Danforth (1935a) pointed out some of the birds' habits, including its use of both arid scrub

and mangroves. Bond (1956) reported that it still occurred in mangrove swamps on the west coast of the island. Diamond (1973) noted that it was abundant in low arid scrub in the northern part of the island, but that the mangrove swamps of St. Lucia had been almost entirely destroyed by 1971. There are 26 specs. held at LSU (15), USNM (4; Danforth 1935a noted these), ANSP (4), and 1 each in the AMNH, UMMZ, and, as noted above, MCZ.

D. petechia petechia: Treatment of the nominate subspecies, limited in distribution to Barbados, has been as much of an impediment as that of ruficapilla to a smooth taxonomic history of the Yellow Warbler. This history has been summarized and clarified by Peters (1927a). The initial use of petechia was in a 1758 drawing of a bird claimed to be from Pennsylvania but clearly of West Indian origin. Early authors felt that the specimen was from Jamaica and used the name D. p. petechia for what is now placed in eo. Meanwhile, Lawrence (1868) described birds from Barbados as D. capitalis. Sharpe (1885) continued to use the term D. capitalis. It was Peters (1927a) who firmly established that the initial description of Motacilla petechia applied to birds from Barbados. Bond (1928) and subsequent authors followed that precedent. Hellmayr (1935) wrote that the original figure "is indeed an excellent representation of the Barbados bird."

I have located a total of 62 specs. in the BMNH (19; 1 referred to by Salvin 1874, another by Sclater 1874, and 5 by Nicoll 1904), MCZ (16), AMNH (9), USNM (7; probably including those described by Lawrence 1868), FM (6; noted by Cory 1886b and Hellmayr 1935), LSU (3), PM (1; see note concerning Bond's treatment of this spec. below), and ZMA (1).

Feilden (1889) considered the bird "extremely common throughout the island from the higher elevations to the shore-line." Some of Feilden's claims were reiterated by Clark (1905b). Bond (1930) called it "a common bird throughout the island." Since then, however, its population has declined. By 1950, Bond wrote that it had become very rare "owing probably to its being victimized by the cowbird (Molothrus), a comparatively recent resident of the island." Bond (1959) wrote that it occurred then only on the west coast of the island. By 1984, Bond wrote that Hutt estimated that the population was down to 6 or 8 pairs near Graeme Hall and a few along the west coast. If not extinct, this subspecies is certainly severely threatened.

Bond (1959) also noted that M. B. Hutt felt that Barbados was regularly visited in winter by migrant North American Yellow Warblers. Nonetheless, Bond (1959) also wrote that a specimen in the PM that he had previously identified as D. p. aestiva (Bond 1957) was an immature of the resident subspecies.

D. petechia alsiosa. This subspecies is distributed on several of the small Grenadines south of St. Vincent (St. Vincent itself lacks breeding Yellow Warblers). On at least several islands, populations of alsiosa are apparently endangered.

Grenadines - Clark (1905b) was the first indicate that Yellow Warblers are resident in the Grenadines, but termed them D. ruficapilla, the name at that time for birds no closer than Dominica. He found them in one mangrove swamp on Union, abundantly on Prune Island, rarely on Carriacou, and rarely on Grenada (Grenada will be discussed separately). The subspecies was described by Peters (1926) on the basis of a specimen from Prune Island (the type) and 5 others from Carriacou (all in MCZ). Bond (1930) commented that the bird is particularly common on Prune Island and also occurs on Union and Mayero and, rarely, on Carriacou. Later, he specified that it is common on Prune, less numerous on Carriacou and Union, and probably casual on Mayero, and that it is confined to mangrove swamps (Bond 1950). The described range was further reduced by Bond (1984), who wrote that the subspecies is known only from Union and Prune, and that Carriacou reports may have been of North American migrants. By 1986, J. Faaborg reported that the Union population had been reduced to 8 or ten individuals due to overgrazing and cutting of lumber, including the mangroves (Bond 1986). I know of 2 specs. from Mayero, 1 in the AMNH collected in 1925 and the other at LSU collected in

Dec. 1961. There are 5 specs. from Union, 4 alsiosa (1 in USNM and 3 in AMNH) and 1 migrant taken on 4 Nov. 1925 (AMNH). I have located 23 specs. from Prune Island at LSU (13), AMNH (5), USNM (2), MCZ (1), UMMZ (1), and ANSP (1). The 5 specs. in the MCZ mentioned above are the only ones of which I am aware from Carriacou. Thus, on the basis of specs., it appears that the subspecies has resided on each of the 4 islands during this century. Its current status is uncertain, except for perhaps Prune Island where it appears to be more numerous.

Grenada - Wells (1886) commented that D. petechia was not numerous on Grenada in mangrove swamps on the windward side of the island and also noted that he had acquired a male spec. Clark (1905b) wrote that the same birds that inhabited the Grenadines (which he called D. ruficapilla) were also rare on Grenada (he was doubtlessly quoting Wells on this matter). Clark (1905a) looked further into the question by examining the specimen (now in the USNM) that Wells had collected on 14 Nov. 1882. Wells had apparently thought it to be a migrant and Ridgway (1902) used it as the basis for inclusion of migrant D. aestiva in the West Indies. Clark (1905a) however, could not tell this specimen from immature males of "D. ruficapilla" (= D. p. alsiosa) from Carriacou and suggested that the matter be left unresolved. Clark (with the assistance of Outram Bangs) did not, however, look at the shape of the primaries, a character usually very useful for distinguishing pointed-

winged migrants from blunter-winged non-migratory inds.. Bond (1957) specified that Wells' specimen is D. p. aestiva; the specimen is still labelled as a migrant in the USNM. There are also 2 specs. in the BMNH from 22 Sept. and 19 Nov. 1891 that are labelled as migrants. Bond (1930) wrote that there are no specs. of alsiosa from Grenada and that he had not located it in his personal searches. However, there is a third BMNH spec. taken on 1 Jan. 1904 that is labelled D. p. alsiosa. Thus, a situation that seemed to have been resolved remains in confusion.

Migrant Yellow Warblers - The specimens mentioned above from Union Island and Grenada are the only migrant Yellow Warbler specs. from the Lesser Antilles of which I am aware. There are sight reports from St. Vincent by I. A. E. Kirby from 10 Oct. to 24 March (Bond 1965). Migrant birds may reach the southern Lesser Antilles from the south, as they are not infrequent on the South American mainland and Trinidad. They may only be noticed on islands like Grenada and St. Vincent that lack resident birds and may be taken for immatures or females of the resident subspecies on other islands (although specimens are readily differentiable). It would be curious indeed if the ranges of wintering migrants and resident subspecies were completely complementary.

Dendroica pensylvanica. Chestnut-sided Warbler.

Antigua - Sighting, of an immature bird for about 20 min, 30 Nov. 1974 (Holland and Williams 1978, also in Bond 1980).

Barbados - Sighting, of a bird in spring plumage, 31 March 1969 (by M. H. Mitchell, reported by Bond 1969).

Dendroica magnolia. Magnolia Warbler.

St. Martin - Sighting, 1 Dec. 1983 (Bond 1984, Norton 1984).

Antigua - Several observed, from 29-31 Oct. 1974 (Holland and Williams 1978, also in Bond 1980).

Barbados - 1 spec., 12 April 1954 (PM; Bond 1959, 1969).

Dendroica tigrina. Cape May Warbler.

St. Martin and St. Eustasius - Bond (1980) did not accept the reports of Hoogerwerf (1977), who claimed to have seen Yellow-rumped Warblers on St. Martin from 27 Dec. 1974 through 12 Jan. 1975 and on St. Eustasius on 16 Dec. 1974. Bond indicated, among other things, that Cape May Warblers could possibly be misidentified as Yellow-rumped Warblers. Voous (1983) then went so far as to list tigrina on both islands on the basis of Bond's hypothesis. Although tigrina is more likely in the Lesser Antilles in general, there are no other reports of either species from either island, and it would seem wise to list neither species as anything more than hypothetical.

Barbuda - Listed by Bond (1950) and Pinchon (1963) without specific data.

St. Kitts - Specimen, 15 Feb. 1982 (USNM, not in lit.).

Antigua - Several observed, Oct. and Nov. 1974 (Holland and Williams 1978, also in Bond 1980).

Montserrat - Bond (1939b) wrote that a male collected on 31 Dec. 1929 is in the ANSP (repeated by Danforth 1939b; although I have current ANSP collection records, I find no mention of this spec.). Another male was observed on 10 April 1962 (Schwartz and Klinikowski 1963).

Guadeloupe - 2 specs. located, undated (AMNH). These may have been from among the birds sent by Colardeau, at least 1 of which was collected on 11 Feb. 1882 (Lawrence 1886). Danforth (1939a) reported that Colardeau had sent 3 specs. to the USNM and that the doctor "usually found them in coffee shade trees in the mountains, reporting it from Nov. to April."

Dominica - Sighting, 4 Feb. 1971 (by J. Terborgh, in Bond 1971).

Martinique - Sighting, 2 Feb. 1962 (Schwartz and Klinikowski 1963, also in Pinchon 1963).

St. Lucia - 3 specs. located, all 5-6 Jan. 1962 (LSU; Schwartz and Klinikowski 1963, termed fairly common). Bond (1928) collected a female (not located) and observed several other inds. on 16 March 1927. Danforth (1935a) considered the species rare on the basis of Bond's report.

Barbados - Sighting, in Feb. (by M. B. Hutt, in Bond 1959).

St. Vincent - Sightings: undated (Bond 1959), 20 Jan. (Bond 1965), and in March (Lack et al. 1973).

Dendroica caerulescens. Black-throated Blue Warbler.

St. Martin - Sighting, 1 Dec. 1983 (Bond 1984, Norton 1984).

Antigua - One bird (presumably) was repeatedly observed at one locality from Oct. to Dec. 1974 (Holland and Williams 1978, also in Bond 1980).

Guadeloupe - Sighting, of 4 birds, 22 Nov. 1969 (Guth 1971, also in Bond 1971).

Dominica - Sighting, of a male, 23 Jan. (by J. Terborgh, in Bond 1971).

Dendroica coronata. Yellow-rumped Warbler.

St. Martin and St. Eustasius - Hoogerwerf (1977) reported seeing this species 3 times on St. Martin in Dec. 1974 and the following Jan. (including 1 time when he saw 4 to 6 inds.) and once on St. Eustasius on 16 Dec. 1974. However, Bond (1980) felt that these records could not be accepted because this species is a rare vagrant to the Antilles and the relatively common D. tigrina has occasionally been misidentified as D. coronata.

Antigua - Sighting, in the winter of 1937-38 (Danforth 1939c, on the basis of an "accurate description" by G. O.

Nugent). Holland and Williams (1978) indicated that the species had previously been reported but had not been noted in their study nor in the 5 years prior to it.

Barbados - 1 spec., 1 May 1954 (PM; noted by Bond 1968, 1969). Sighting, in Jan. (Bond 1958).

Dendroica virens. Black-throated Green Warbler.

St. Martin - Sighting, 1 Dec. 1983 (by M. Robbins, noted by Bond 1984 and Norton 1984).

Barbuda - Sighting, undated (by J. H. Marshall, Jr., in Bond 1976).

Antigua - Sighting, 14 Dec. 1974 (Holland and Williams 1978, also in Bond 1980).

Guadeloupe - 2 specs.: 30 Jan. and 11 Nov. 1902 (AMNH; not in lit., although Pinchon 1963 alluded to an unspecified Guadeloupe spec.). Lawrence (1885) reported that this species is relatively common from Nov. to March in the upper branches of medium-sized trees. Danforth (1939a), quoting the same source as did Lawrence, wrote that "Dr. Colardeau reported it as rather common from Nov. to March in coffee plantations." Ridgway (1902), Bond (1950), and Bent (1953) listed the bird on the basis of these reports.

Dominica - 1 spec., undated (USNM; not in lit., except perhaps for a vague reference by Bond 1980). A reported sighting published by Lawrence (1878a) was repeated by Cory (1886a), and may have served as the basis for listing by

Sharpe (1885). Subsequently listed by Ridgway (1902), Bond (1950), and Bent (1953).

Barbados - Sighting, late April (by M. B. Hutt, in Bond 1959).

Dendroica fusca. Blackburnian Warbler.

Martinique - Hellmayr (1935) and Bond (1950) both questioned the validity of the source of a Blackburnian Warbler from "Martinique" described as Sylvia melanorhoa by Vieillot in 1817.

Grenada - 1 spec., 5 Oct. 1891 (BMNH; not in lit.).

Dendroica dominica. Yellow-throated Warbler. Pinchon (1963) indicated that 3 specs. (not located) had been collected from British islands of the Lesser Antilles but did not supply any specific data.

Montserrat - 1 spec., 11 Feb. 1904 (BMNH; Nicoll 1904 collected this from "thornbushes along the shore.") This was the basis for listings by Danforth (1939b), Bond (1942, 1950), and Bent (1953).

Guadeloupe - Sightings, 20 and 23 Nov. 1969 (probably of 1 ind., by W. W. Channel, in Bond 1970).

Dendroica adelaidae - Adelaide's Warbler is a permanent breeding resident of Puerto Rico, Barbuda, and St. Lucia, but not, at least currently, of any of the intervening islands. According to Terborgh (1973), "of all West Indian

birds, [this] has perhaps the most discontinuous range." It is a bird of scrub and low forest growth that is most closely related to D. graciae, D. dominica, and D. pityophila (Bond 1930).

Barbuda - There are 39 specs. housed in the USNM (22), ANSP (8), AMNH (6), LSU (2), and MCZ (1). Birds from Barbuda were first described by Riley (1904) as Dendroica subita, a new species distinct from what were then considered two species on Puerto Rico and St. Lucia. This was based upon a series of 13 specs. collected in 1903 (now divided between the USNM, AMNH, and MCZ) that was apparently the first evidence that this form existed on Barbuda. Bond (1930) relegated the population to subspecific status (D. adalaidae subita) and considered it common on the island. Hellmayr (1935) cited the two above publications but did not refer to any specimens. Danforth (1935b) visited Barbuda in Aug. of 1933, during which time he collected 8 specs. (now in the USNM) and found the bird to be very common, particularly in shrubs in the southern part of the island. At that time, he still considered the three island populations to represent distinct species. In 1977, Bond wrote that two separate observers had commented to him that the bird was not common. Later, Bond (1982) noted that D. petechia had become dominant in the shrubby regions in which Adelaide's Warblers had been abundant in the 1920's. "Decent populations" still existed according to J. Faaborg

(Bond 1986), but it appears nonetheless that numbers have declined over the past half century.

St. Lucia - There are 114 specs. in the AMNH (34), FM (20), MCZ (16), LSU (15), USNM (12), BMNH (11), UMMZ (3), CM (2), and PM (1). Of these, the 42 that are undated presumably include many collected by Semper in or around 1870. Adelaide's Warblers were reported from St. Lucia several decades before notice of their presence on Barbuda was published. They were noted by Sclater (1871), Semper and Sclater (1872), and Allen (1880), but not distinguished from Puerto Rican birds. Ridgway (1883) felt that they were distinct enough to warrant description as a new subspecies, D. adelaidae delicata. Sharpe (1885) treated St. Lucia birds as a separate species, D. delicata, even though he admitted that he had not seen any material from Puerto Rico. Although Sharpe's split was subsequently reversed on grounds of morphological similarity, the treatment of the three populations, isolated from each other by oceanic barriers and numerous unoccupied islands, as separate species is not illogical. Cory (1886a,b) equivocated, treating the bird as a subspecies in 1 publication and as a species in another in the same year. Ridgway (1889) and Sclater (1889b) referred to the birds as D. delicata. Ridgway (1902) also treated it as a full species. Nicoll (1904) collected 5 specs. early in 1904 but commented that the bird was not abundant. Bond (1928) reverted to the earlier treatment of the island's birds as a subspecies. He also commented on its

nidification and its occurrence chiefly in the undergrowth of both virgin forest and second growth. Shortly thereafter, he referred to it as one of the most abundant birds on St. Lucia (Bond 1930). Danforth (1935a) summarized references up to that point and added that he found the species in abundance in June 1931. He described a nest (10 ft above the ground, hidden in vines, and containing 2 young), indicated that the bird forages primarily in the undergrowth, and said that insects, primarily lepidoptera larvae, were the exclusive contents of stomachs he examined. He was the last author to accord this population specific status. Diamond (1973) thought that it was one of the most widespread and abundant species on St. Lucia, "primarily in humid forest but also in all but the most arid scrub, in which it is replaced by the Yellow Warbler." Bond (1982) indicated that the Adelaide's Warbler was far more widespread than D. petechia in the lowlands.

Dendroica discolor. Prairie Warbler.

Anguilla - 1 spec., 2 Feb. 1922 (MCZ). Peters (1927) collected this bird and observed 2-6 others every day of his visit "in nearly all situations," including Acacia-Croton-cactus scrub, vegetation on sandy ridges behind beaches, and in mangroves. Nolan (1978) repeated these observations.

St. Martin - Sightings: 24 Dec. 1927 (Danforth 1930, also in Voous 1955), 3 Oct. 1959 (the earliest date, according to Voous and Koelers 1967), and 9 Jan. 1975 (when

several were seen in low, partly cut-down shrubbery, Hoogerwerf 1977).

Barbuda - 4 specs., all from 2-23 Nov. 1903 (2 in USNM; noted by Riley 1904 and Danforth 1935b; 2 in AMNH, not in lit.).

Saba - 2 specs.: 26 Jan. 1937 (USNM; Danforth 1938 noted this plus 2 sightings on that date and another 2 days later), and from dry scrub on a hillside on 8 March 1952 (ZMA; Voous 1955; the latest island date, according to Voous and Koelers 1967). Sighting, 15 Feb. 1974 (Hoogerwerf 1977).

St. Eustasius - 5 specs.: 1 each on 20 and 21 March 1890 (FM; Cory 1891a, Ridgway 1902, and Hellmayr 1935), 26 Feb. 1922 (MCZ; not in lit.), and from dry scrub on 21 and 25 Feb. 1952 (ZMA; Voous 1955).

St. Kitts - 4 specs., from 21-27 Feb. 1890 (1 in BMNH, 3 in FM; Cory 1891b, Ridgway 1902, Hellmayr 1935, and Danforth 1936).

Nevis - Danforth (1936) wrote that Bond had recorded this species, presumably during his visit from Dec. 1928 through Jan. 1929. Also listed by Bond (1950).

Antigua - 4 specs.: 1 undated (BMNH; Nicoll 1904), and 1 each on 5 and 13 Oct. 1903 (USNM; noted by Riley 1904), and 4 Aug. 1903 (AMNH; not specifically in the lit., although referred to generally by Danforth 1934). Sightings: late Sept. or early Oct. (Hilditch et al. 1973),

and 28 Nov. 1974 (Holland and Williams 1978 tentatively identified a bird as D. discolor on this date).

Montserrat - 1 spec. located, 12 Feb. 1937 (USNM). Danforth (1939b) noted this plus a spec. from 2 days earlier (not located); these inds. and others on those dates were encountered in dry scrub habitat.

Martinique - 1 spec., undated (USNM; not referred to specifically in the lit.). Listed, perhaps on the basis of this spec., by Ridgway (1902) and Bond (1950). Pinchon (1963) considered it common.

Barbados - Sightings, apparently in April of two different years (by M. B. Hutt, in Bond 1959, 1962).

Grenada - Sighting, in Dec. 1957 (by Devas, in Bond 1973).

Dendroica castanea. Bay-breasted Warbler.

Antigua - The report published by Holland and Williams (1978) of "one bird in winter plumage seen Nov. 26, 1974 in low scrub" should be considered hypothetical according to Bond (1980).

Barbados - Sighting, undated (Bond 1965).

St. Vincent - Sighting, 13 Oct. (Bond 1965).

Dendroica striata. Blackpoll Warbler. This species is known almost entirely as a fall transient in the month of Oct. in the Lesser Antilles.

Anguilla - 2 specs., both 4 Oct. 1982 (USNM; not in lit.).

St. Martin - 1 spec., 7 Oct. 1965 (ZMA; Voous 1983). Small numbers were reported between 7 and 28 Oct. 1965 (Voous and Koelers 1967). Hoogerwerf (1977) claimed to have seen an ind. on 30 Dec. 1974, but Bond (1980) felt that this claim could not be accepted due to the lack of winter records from the Antilles and the possibility that the bird could have been a misidentified D. tigrina. This rejection was repeated by Voous (1983).

St. Eustasius - Hoogerwerf (1977) also claimed a sighting from this island (on 12 Feb. 1974); this was also refuted by Bond (1980) for the reasons listed above.

Antigua - 1 spec., undated (BMNH; Nicoll 1904). Danforth (1939c) commented that he had overlooked this reference in his 1934 list. Sightings: of 22 inds. between 23 Sept. and 11 Oct. 1970 (but not necessarily on those extreme dates, Hilditch et al. 1973), and 1 June 1974 (Holland and Williams 1978; if accurate, this would be a most unusual record).

Guadeloupe - 3 specs. located: 2 undated (AMNH; these may include the 10 Oct. 1882 spec. that Lawrence 1886 and Danforth 1939a attributed to Colardeau; that collector found the birds to be plentiful from that date for 8-10 days before they suddenly disappeared) and 1 from 16 Oct. 1950 (AMNH; not in lit.). Pinchon (1961) noted that many flocks were seen and some birds captured for identification on 10

and 11 Oct. 1958. If those captured were preserved, I have not located them.

Martinique - Sighting, of a flock of 15, 20 Oct. 1958 (Pinchon 1961).

St. Lucia - 4 specs., all undated (MCZ; these are probably the specs. that Semper sent to Allen 1880). Listed by Clark (1911) and Danforth (1935a; on the basis of the Semper specs.).

Barbados - Feilden (1889) collected 1 spec. (not located) in mangroves on 20 Oct. 1888 and later saw 2 or 3 others. Listed by Cory (1892), Clark (1905b), and Bent (1953; 20 Oct. quoted as an early fall date) on this basis. Sighting, 2 April (Bond 1962).

St. Vincent - 1 spec., 28 Oct. 1890 (BMNH; not in lit.; spec. label indicates that inds. were observed as early as 25 Oct.).

Grenada - 11 specs. (all in PM): 10 from 19-31 Oct. 1955 (not in lit.) and 1 from 9 Dec. 1955 (the Plowden-Wardlaw 9 Dec. record in Bond 1956 presumably referred to this spec.; the date, if correct, is clearly very unusual).

Dendroica plumbea. Plumbeous Warbler. This permanent breeding resident consists of two subspecies, one of which breeds on Guadeloupe and the other on Dominica and (at least in the past) on Marie Galante. Although the species has been reported on the Iles des Saintes, its current status

there is uncertain. In addition to the 177 specimens listed, these are 2 from an unspecified island in the ANSP.

Guadeloupe - The 75 specs. located are housed in the USNM (17), AMNH (16), FM (10), LSU (10), MCZ (10), BMNH (6), ANSP (5), and CM (1). 2 specs. collected by Ober in Aug. or Sept. of 1878 were reported by Lawrence (1879) as the first records from this island. One of Ober's specs. was received by Sharpe (1885) at the BMNH. Cory (1886b and 1891b) wrote that the FM specs. had been collected on 2 separate expeditions. Ridgway (1902) noted size differences between Guadeloupe and Dominica birds, but still treated them as one taxon. Brodkorb (1931) named Guadeloupe birds D. plumbea guadeloupensis on the basis of size differences (including those mentioned by Ridgway), necessitating the use of the name D. plumbea plumbea for Dominica and Marie Galante birds. Noble (1916) commented that he "never met this bird anywhere but in the deep woods," often near mountain streams. Bond (1930) stressed the species' preference for forest undergrowth and commented on its similarity to D. pharetra of Jamaica. Later, he indicated that this similarity is based at least in part on plumage similarities of immature inds. (Bond 1950). Danforth (1939a) wrote that "this bird is fairly common wherever deep woods are found, both in the high mountain forest and in the foothills." Terborgh et al. (1978) classified it as an insectivorous foliage-gleaner.

Isles Les Saintes - The species was first reported here (specifically, on Terre-de-haut) by Vaurie (1961), who found 2 singing inds. in dense scrub at the western end of the island on two successive days in July 1960 (this information was repeated by Bond 1961). Terborgh et al. (1978) did not observe or capture this species in mist nets (also in Bond 1978). Bond (1979) then referred to it as a doubtful resident, and the American Ornithologists' Union (1983) included it as possibly only a casual vagrant.

Marie Galante - 8 specs., all 29 Feb.-1 March 1886 (FM; Cory 1886b, Hellmayr 1935). Brodkorb (1931) assigned these birds to the subspecies from Dominica (even though Marie Galante is considerably closer to Guadeloupe). Danforth (1939a) commented that "there is no country on Marie Galante now which would seem to be suitable for this bird, and I doubt very much if it still exists there." Bond (1950) considered them "very local if not extirpated." Pinchon (1963) indicated that it is possible to find them in upland forest, leading Bond (1964) to write that they were still present in small numbers.

Dominica - 107 specs. are housed at LSU (32), PM (16), AMNH (15), USNM (13), FM (10), MCZ (9), BMNH (7), UMMZ (3), Cornell (1), and CM (1). 11 specs. collected in 1877 were used by Lawrence to describe the species (1878e) and also to list it in the island's avifauna (1878a). Sharpe (1885) indicated that the BMNH had received 1 of these specs. and Sclater (1889a) later wrote that 1 or more additional specs.

were sent to England by Ramage. Cory (1886a) listed the island on the basis of the specs. in the FM. Verrill (1892) noted that the birds were "very abundant, found nearly everywhere" and that nests found in April were located in low shrubbery. Bond (1941) commented on a nest found with 2 eggs hidden in a bush 6 ft above the ground on 11 May 1935. Bond (1928) considered it "probably the most common of all forest birds in Dominica," where it prefers virgin forest over second growth. Schwartz and Klinikowski (1963) countered Bond's claims of preference for forest, claiming that the bird is more common in "lowland, xeric habitats than in rain forest at medium to high elevations."

Catharopeza bishopi. Whistling Warbler.

This species occurs only on St. Vincent. Andrle and Andrle (1976) published many details on the behavior and ecology of this species and also summarized all that had been written about it up until that time. They felt that the species was generally distributed through about 90 km² of forest along the island's central chain of mountains. This range had, between the bird's discovery and their visit in 1973, been diminished by at least 50% due to volcanic activity and deforestation. However, birds were fairly common in suitable habitat and the authors roughly estimated that the population consisted of 1500 breeding individuals. They felt that ample habitat existed for maintenance of a

viable population as long as it was not destroyed by vulcanism or deforestation by humans.

Kepler and Parkes (1972) strongly suggested that bishopi be placed in the genus Dendroica, to which it is generally acknowledged that Catharopeza is closely related. However, Lack et al. (1973), Bond (1974), and Andrie and Andrie (1976) all felt that the evidence for lumping was not entirely convincing, and that Catharopeza should be retained for the time being. I have located 31 specs. in the USNM (9), BMNH (8; Lister 1880 noted 2 specs.: 1 probably among these and the other not located), MCZ (6), AMNH (5), LSU (2), and FM (1). There are, at the least, 2 specs. noted by Lawrence (1878b) that I have not located.

Mniotilta varia. Black-and-white Warbler.

Anguilla - Listed by Cory (1892) without details.

St. Martin - Danforth (1930) observed 1 on 24 Dec. 1927. This sighting as well as 1 or 2 others on 6 Feb. 1952 were noted by Voous (1955). Voous and Koelers (1967) reported a 3 Oct. 1956 sighting and indicated, contrary to prior evidence, that Danforth had collected a spec. on 24 Dec.; I do not believe that such a spec. exists. Voous (1983) reiterated the claim of a Danforth spec. and noted a total of 8 sight reports, the earliest from 30 Sept. 1973. This early date had been reported by Hoogerwerf (1977), who also observed 2 birds on 20 Feb. 1974 and netted 1 on 8 Jan. 1975.

Barbuda - 3 specs.: 1 each from 17 and 23 Nov. 1903 (USNM; Riley 1904) and 26 Nov. 1903 (AMNH; not in lit.).

Saba - Sighting, 21 March 1955 (by H. H. Collins, Jr., in Voous and Koelers 1967 and Voous 1983).

St. Eustasius - 2 specs. located: 1 undated (USNM; not specifically in the lit.), and 1 from 23 March 1890 (BMNH; Cory 1891). Cory (1892), Voous (1955, 1983), and Voous and Koelers (1967) referred presumably to one or both of these specs. Hellmayr (1935) indicated that there were 2 specs. in the FM (not located). Sightings: 26 Feb. 1952 (Voous 1955), and another undated (by Holthuis, in Voous and Koelers 1967).

St. Kitts - 4 specs.: 1 from 2 Jan. 1888 (FM; Hellmayr 1935, Danforth 1936), 2 from 1 March 1922 (MCZ; not in lit.), and 1 from 16 Feb. 1982 (USNM; not in lit.).

Nevis - Listed by Danforth (1936, on the basis of a report by Bond) and Bond (1950).

Antigua - 10 specs. located: 7 from 9 Oct. 1903-13 Feb. 1904 (4 in USNM, 2 in AMNH, 1 in BMNH; Riley 1904 noted 5, referring at least to those in the USNM; Nicoll 1904 noted the series without mentioning details), 2 from 23 March 1962 (LSU; not in lit.), and 1 on 13 Jan. 1983 (USNM; not in lit.). Danforth (1939c) reported that the species had been observed from Nov. until as late as 14 April 1938. Holland and Williams (1978) considered it one of the four common wintering warblers on Antigua.

Montserrat - 1 spec. located, 10 April 1962 (LSU; not in lit.). Danforth (1939b) indicated that he collected a spec. on 12 Feb. (not located) and observed another ind. on 18 Feb. 1937.

Guadeloupe - 6 specs.: 1 from 9 Feb. 1891, 4 from 1-14 Feb. 1902, and 1 undated (all AMNH; none in lit.). Both Lawrence (1886) and Danforth (1939a) quoted Dr. Colardeau, who considered the Black-and-white Warbler common from the end of Oct. to the beginning of May.

Marie Galante - Sighting, 5 March 1963 (Schwartz and Klinikowski 1965).

Dominica - 4 specs.: 1 from 23 Nov. 1904 (FM; not in lit.), and 3 from 6 April 1961 (LSU; not in lit.). Listed by Bond (1950) and Bent (1953, as an eastern boundary of the bird's range).

Martinique - Listed by Bond (1950) without specific data.

St. Lucia - Sighting, 13 Jan. 1962 (Schwartz and Klinikowski 1963).

Barbados - Sightings: one in Oct. (by French, in Bond 1958) and another undated (by M. B. Hutt, in Bond 1959).

Setophaga ruticilla. American Redstart. Perhaps the most common and widespread migrant warbler in the Lesser Antilles (see discussion and Table 1).

Sombrero - Listed by Lawrence (1867) and Cory (1892). This is the only warbler species reported from Sombrero.

Anguilla - Sighting, of 3, in Feb. 1922 (Peters 1927b).

St. Martin - 4 specs., all from 2-11 Feb. 1952 (ZMA; Voous 1955). Sightings: 22 and 26 Dec. 1927 (Danforth 1930), 4 Oct. 1956 (the earliest date, according to Voous and Koelers 1967), and 19 April 1981 (the latest date, Voous 1983). Referring to the northern Netherland Antilles in general, Voous (1983) wrote that this species is "rather numerous in some years, almost absent in others."

Barbuda - 6 specs. located, all from 15 Oct.-18 Nov. 1903 (5 in USNM; 1 in AMNH). Riley (1904) and Danforth (1935b) referred to 7 specs. collected 10 Aug.-23 Nov. 1903 (note the greater extremities of their dates). Bent (1953) quoted 10 Aug. as an early fall date.

Saba - 2 specs.: 28 Jan. 1937 (USNM; Danforth 1938, also in Wetmore 1949) and 6 March 1952 (ZMA; Voous 1955). Sighting, 21 March 1955 (the latest known date, according to Voous and Koelers 1967).

St. Eustasius - 10 specs.: 8 from 21-30 March 1890 (6 in the FM; Cory 1891a; Hellmayr 1935 noted 7; 2 in BMNH), 1 from 24 Feb. 1922 (MCZ; not in lit.), and 1 from dense woods on 28 Dec. 1927 (USNM; Danforth 1930). Voous (1955) noted the species from gardens and rain forest.

St. Kitts - 17 specs. located: 16 from 25 Dec. to 9 March, all between 1887 and 1891 (2 in BMNH; 14 in FM; Cory 1892, Hellmayr 1935, and Danforth 1936), and 1 from 16 March 1922 (MCZ; not in lit.).

Nevis - Listed by Danforth (1936).

Antigua - 18 specs. located, all from 9 Aug. 1903-2 March 1904 (5 in the USNM were noted by Riley 1904; 11 in the AMNH and 2 in the FM [not in lit.] include specs. from more extreme dates than those noted by Riley). Danforth (1934) wrote that Ober collected 1 or more specs. in 1877 (not located). Lawrence (1878c) termed the species rare on the basis of Ober's experience. Holland and Williams (1978) considered the species a common winter resident from Oct. to March.

Montserrat - 2 specs.: 11 Feb. 1904 (BMNH; Nicoll 1904) and 9 Feb. 1937 (USNM; Danforth 1939b collected this and saw many between that date and the 16th of the month).

Guadeloupe - 13 specs. located: 2 from Sept. of an unknown year and 2 undated (USNM; Lawrence 1879b noted a pair taken in Aug. or Sept. 1878 and Danforth 1939a referred to 6 specs. in the USNM [I know of none beyond these 4], including 3 collected by Ober in Sept.; the linkage between these reports and the located specs. is unclear), 1 taken 15 Feb. 1886 (FM; Cory 1886b), 1 each on 22 and 28 Sept. 1890 (FM; Cory 1891b, Danforth 1939a; Hellmayr 1935 noted 2 of the FM specs.), and 6 collected from 29 Jan.-2 Feb. 1902 (AMNH; not in lit.).

Marie Galante - 2 specs., 26 Feb. and 2 March 1886 (FM; Cory 1886b, Hellmayr 1935, and Danforth 1939a).

Dominica - The relationships between lit. references and the 19 specs. located are unclear. There is 1 undated spec. (USNM; I would think that this may be the spec. that

Lawrence 1878a indicated that Ober had collected in 1877, except that the spec. is denoted as a female and Lawrence had referred to a male) and another from an unspecified date in 1883 (USNM; not in lit.). Also located are 1 each from 10 March and 9 April 1890 (PM; Verrill 1892 presumably referred to these specs.; he also observed birds up until 1 May), and 5 that are probably from 15 and 16 Oct. 1899 (AMNH; dates on the labels are not clear; these are not in the lit.). The BMNH has the 9 Jan. 1889 spec. that Sclater 1889a noted receiving and a 9 Feb. spec. collected by Nicoll (1904). Other specs. not in the lit. include 1 from 28 Jan. 1904 (FM), 4 from 23 Oct.-26 Nov. 1904 (FM), 1 each from 4 Jan. 1905 (MCZ), 3 Jan. 1908 (FM), and 10 April 1964 (USNM). Extreme dates from the list of specs. are 15 Oct. and 10 April. Clark (1905c) wrote that Selwyn Branch considered this a nesting resident of Dominica. This delusion was quashed by Bond (1930). Norton (1983) noted a 5 April sighting.

Martinique - 11 specs.: 1 from Nov. 1881 (BMNH; not in lit.), 8 from 28 Oct.-7 Nov. 1886 (FM; Cory 1887, Hellmayr 1935 noted 9), 1 undated (MCZ; this may be the bird referred to by Lawrence 1878d), and 1 from 25 Jan. 1925 (MCZ; not in lit.).

St. Lucia - 35 specs.: 25 undated (24 in MCZ and 1 in BMNH; the MCZ birds were presumably in the shipment that Allen 1880 received from Semper), 2 from 1875 (BMNH; Sclater 1876 and Sharpe 1885 noted receiving these from Semper), 1

ind. 26 March 1889 (also BMNH; Sclater 1889b noted receiving this from Ramage), 2 from 30 March 1892 (FM; Cory 1892, Hellmayr 1935), 1 each from 2 and 3 Feb. 1904 (BMNH; Nicoll 1904), and 1 each from 5 and 30 Nov. 1900 and 10 Jan. 1907 (AMNH; not in lit.). The species was listed by Clark (1911). Bond (1928) wrote that it was perhaps the most common land bird wintering on St. Lucia and Danforth (1935a) considered it "apparently by far the commonest of the North American warblers which visit the island in winter."

Barbados - 4 specs.: 1 each from 9 Feb. 1886 (FM; Cory 1886b, Hellmayr 1935), 12 Sept. 1903 (MCZ; not in lit.), and 13 March and 10 April 1954 (both PM; not in lit.). Feilden (1889) observed it as early as mid-Sept. and as late as Feb. and Clark (1905b) listed it as common.

St. Vincent - 5 specs. located, none specifically in the lit.: 3 from 14-26 Nov. 1889 (2 in BMNH, 1 in AMNH) and 1 each from 3 and 18 Feb. 1890 (BMNH). Ober collected at least 1 spec. (not located) and wrote that it was "not often seen" during his visit in 1878 (Lawrence 1878b). Listed by Cory (1892), Clark (1905), and Bond (1928, on the basis of a 1927 visit).

Grenada - 3 specs., all undated (MCZ; 1 of these may be the spec. noted by Wells 1886). Lawrence (1879a) reported that Ober shot the only ind. he saw but was unable to retrieve it. Clark (1905b) considered it common at moderate elevations but not in high woods. Sighting, 20 March 1971 (Lack and Lack 1973).

Protonotaria citrea. Prothonotary Warbler. Because it tends to inhabit mangroves on its wintering ground, this species may be less conspicuous than some others.

Anguilla - Sighting, late March or early April (Bond 1973).

St. Martin - Sighting, 1 Dec. (by M. Robbins, in Bond 1984 and Norton 1984).

Barbuda - Sighting, 2 Jan. 1977 (by J. H. Marshall, Jr., and others, in Bond 1977). This was the only sighting of a migrant warbler species in either of the Barbuda Christmas Bird Counts (Pashley and Martin 1988).

Montserrat - Sighting, 9 April 1962 (Schwartz and Klinikowski 1963).

Martinique - 1 spec., 7 Oct. 1950 (AMNH; noted by Bond 1952 and Pinchon 1963).

St. Lucia - 1 spec., 13 Jan. 1962 (LSU; Schwartz and Klinikowski 1963).

Barbados - A 26 Oct. sighting (by M. B. Hutt, in Bond 1959) was one of Hutt's several winter reprotos (Bond 1962).

Grenada - 1 spec., 22 Nov. 1961 (LSU; Schwartz and Klinikowski 1963). These authors also noted a 26 Feb. 1961 sighting.

Helmitheros vermivorus. Worm-eating Warbler.

St. Martin - Sighting, 20 Oct. 1985 (Norton 1986a).

Antigua - Sightings, of several during Oct. and Nov. 1974 (Holland and Williams 1978, also in Bond 1980).

Seiurus aurocapillus. Ovenbird.

Anguilla - 1 spec., 6 Feb. 1922 (MCZ; Peters 1927b collected this bird and observed another on 11 Feb. 1922).

St. Martin - Danforth (1930) referred to a spec. collected on 24 Dec. 1927 (not located; also noted by Voous 1955, Voous and Koelers 1967, and Voous 1983).

Barbuda - 1 spec., 21 Jan. 1983 (USNM; not in lit.).

St. Eustasius - 1 spec., 24 Feb. 1922 (MCZ; not in lit.)

St. Kitts - 1 spec., 15 March 1922 (MCZ; not specifically in the lit.). Listed, however, by Bond (1950) without details.

Antigua - 12 specs.: 11 from 9 Oct.-14 Dec. 1903 (5 in USNM, noted by Riley 1904; 6 in AMNH, not in lit.; Danforth 1934 referred to this series without specific details), and 1 from 13 Jan. 1983 (USNM; not in lit.). Sightings, in Nov. and Dec. 1974 and again in Nov. 1975 (Holland and Williams 1978).

Montserrat - Listed by Danforth (1939b; on the basis of a report by Bond) and Bond (1950).

Guadeloupe - Listed by Danforth (1939a; on the basis of a report by Bond) and Bond (1950).

Iles Les Saintes - Listed by Danforth (1939a), Vaurie (1961) (both on the basis of a report by Bond), and Bond (1950).

Dominica - Bond (1952) wrote that a bird was seen "for several days during 1950."

Martinique - Listed by Bond (1950) and Bent (1953) without specific data.

St. Lucia - 1 spec., 2 Oct. 1900 (AMNH, not in lit.). Listed by Clark (1911). The comment by Danforth (1935a) that because Clark "does not state the basis for including it in this list I am listing it hypothetically pending further information" can be rejected on the basis of the specimen. Sighting, undated (Bond 1959).

Barbados - Bond (1977) noted a spec. dated 5 June (not located). Sighting, late April (Bond 1959).

St. Vincent - Listed by Clark (1905d) and Bond (1950 and 1951, on the basis of inclusion by Clark).

Seiurus noveboracensis. Northern Waterthrush. June is the only month for which there are no reports of this species.

Anguilla - Sighting, 11 Feb. 1922 (Peters 1927b).

St. Martin - 3 specs.: 1 each on 22 and 26 Dec. 1927 (USNM; Danforth 1930 collected these and saw birds frequently by small streams and in mangrove swamps) and on 9 Feb. 1952 (ZMA; Voous 1955) Hoogerwerf (1977) saw 1 or more birds in open shrub forest from 20-24 Feb. 1974 (the latest observation date, according to Voous 1983), and also

reported 3 sightings in Dec. 1974-Jan. 1975. The earliest published observation date is 4 Sept. 1957 (Voous and Koelers 1967).

Barbuda - 8 specs., all from 25 Aug.-23 Nov. 1903 (6 of these in the USNM were noted by Riley 1904; 2 in the FM are not in the lit.).

Saba - Sighting, undated (Bond 1974, also in Hoogerwerf 1977 and Voous 1983).

St. Kitts - 3 specs., none in the lit.: 1 each from Feb. 1899 (BMNH) and 17 and 18 Feb. 1982 (USNM).

Nevis - 1 spec., 2 April 1922 (MCZ; not in lit.).

Antigua - 14 specs. located: 1 from 6 Sept. 1877 (AMNH) and an old spec. in the USNM from 6 Sept. of an unspecified year (these are probably both 1877 Ober specs.; Lawrence 1878c and Danforth 1934 wrote that Ober had collected at least 1 spec. in 1877 and considered the bird rare in Aug. and Sept.), 11 from 1 Oct.-14 Dec. 1903 (Riley 1904 noted 7 in the USNM, but not 4 in the AMNH; the extreme dates of the series are in the latter set), and 1 from 15 Jan. 1983 (USNM; not in lit.). Holland and Williams (1978) considered the species common from Sept. to April.

Montserrat - 1 spec., 9 April 1962 (LSU; not in lit.). Sighting, in mangroves, 12 Feb. 1937 (Danforth 1939b).

Guadeloupe - 7 specs.: 1 from 1879 (BMNH; from mangroves according to Lawrence 1879b; also in Sharpe 1885), 1 each from 18 and 28 Sept. 1890 (FM; Cory 1891b, Hellmayr 1935, Danforth 1939a), 1 undated (AMNH), 1 from Sept. of an

unknown year (USNM), and 1 each from 10 Feb. 1902 (AMNH) and 27 Feb. 1963 (LSU). The latter 4 have not been reported in the lit.; the undated and Sept. specs. may be from the Ober expedition that produced the 1879 BMNH specs.

Dominica - 6 specs.: 1 undated (USNM; perhaps the spec. referred to by Lawrence 1878a and Verrill 1892), 1 from an unspecified date in 1899 (AMNH), 2 from 13 Nov. 1904 (FM), and 1 each from 19 and 30 March 1964 (both USNM); the last 5 are not in lit. Lawrence (1878a) considered this species very scarce.

Martinique - 5 specs.: 4 from 29 Oct.-23 Nov. 1886 (FM; Cory 1887, Hellmayr 1935) and 1 from 18 Dec. 1949 (AMNH; not in lit.).

St. Lucia - 9 specs.: 4 undated (3 in MCZ, 1 in USNM; these may include the specs. that Allen 1881 noted receiving from Semper), 1 each from 5 Nov. and 5 Dec. 1900 and 5 and 6 Jan. 1901 (all AMNH; none in lit.), and 1 dated 3 March 1934 (USNM; Danforth 1935a noted a 10 March 1934 spec., presumably the same bird).

Barbados - 3 specs. located (none in lit.): 1 each in Feb. 1924 (AMNH), and on 24 March and 3 April 1954 (PM). Feilden (1889) observed 1 on 5 Nov. and collected another on 24 Nov. 1888 (not located). Clark (1905b) repeated Feilden's notes.

St. Vincent - 1 spec., 24 Sept. 1890 (BMNH; not specifically in the lit.). Listed by Clark (1905b, as occurring regularly in mangroves, and 1905d).

Union Island - 1 spec., 4 Nov. 1925 (AMNH; not in lit.). Clark (1905b) wrote that the bird occurs generally in the Grenadines wherever there are mangroves.

Carriacou - Listed by Wells (1902) and Clark (1905b, who commented that Wells observed it "all the year round").

Grenada - 7 specs. located, none in the lit.: 1 each from March and 5 Oct. 1891 (both BMNH), from sometime in May 1904 (MCZ), and on 28 Oct. and 7 Dec. 1955 (PM), and 21 Feb. and 3 March 1961 (LSU). Wells (1886) collected a spec. (not located) and considered it not numerous in mangroves and at the outlets of some streams. Clark (1905b) included the bird in his list (presumably based upon Wells' notes). Bond (1959) reported that a flock of about 7 was seen by J. Groome on 28 July 1958 and Lack and Lack (1973) observed 1 in mangroves on 19 March 1971.

Seiurus motacilla. Louisiana Waterthrush.

St. Martin - Sighting, 6 Sept. 1980 (Norton 1981, also in Voous 1983).

St. Barthelemy - Bond (1952) noted a spec. taken in late Sept. 1950 (not located).

Barbuda - Listed by Bond (1950) and Bent (1953) without specific data.

St. Kitts - 1 spec., undated (FM; Hellmayr 1935, also in Danforth 1936).

Antigua - 3 specs.: 6 Sept., no year on label (USNM; presumably the spec. that Lawrence 1878c referred to from

Aug. or Sept. of 1877 and that Danforth 1934 noted from 1877), 19 Sept. 1903 (USNM; Riley 1904, Danforth 1935), and 15 Jan. 1983 (USNM; not in lit.). Holland and Williams (1978) commented that the species had been "previously reported by Danforth, but neither seen nor heard in the last 5 years."

Montserrat - 1 spec., 29 Jan. 1883 (USNM; not in lit.). Listed by Danforth (1939b, on the basis of a report by Bond), and Bond (1950).

Guadeloupe - 2 specs.: 3 Jan. and 10 April 1902 (AMNH; not in lit.). Listed by Bond (1950) and Bent (1953), perhaps on the basis of these specs., but without details.

Dominica - Listed by Bent (1953) without details. Sighting, 19 March 1975 (Bond 1980).

Barbados - Sighting, undated (Bond 1965).

St. Vincent - 1 spec., 20 Feb. 1890 (BMNH; Bond 1957).

Oporornis formosus. Kentucky Warbler.

Antigua - Observed by Holland and Williams (1978) in dense shrub in Dec. 1974 and Feb. and Nov. 1975. Bond (1980) felt that this report should be considered hypothetical.

Guadeloupe - "Clear views were easily obtained" of a bird on 10 Feb. 1963 (Schwartz and Klinikowski 1965).

Oporornis agilis. Connecticut Warbler. The migratory route and wintering range of this species are among the most

poorly known of any warbler. Eisenmann (1955) wrote that "judging from the regular occurrence in Florida in migration, the natural assumption is that it uses the West Indies route, yet James Bond says he know of only 1 spec. report from the Antilles." There are none from the Lesser Antilles.

St. Martin - Voous and Koelers (1967) wrote that the bird that they collected on 4 Oct. 1956 was "too much damaged to be preserved, but identified on presence of complete white eyering" (this record was repeated by Bond 1967). Lanyon and Bull (1967) felt that due to a certain amount of variation in eyering, some O. philadelphia could be misidentified as O. agilis. Although there are no Mourning Warbler reports, inconclusive or otherwise, from the Lesser Antilles, the Connecticut Warbler should nonetheless be considered hypothetical for the region.

Geothlypis trichas. Common Yellowthroat.

Antigua - Sighting, of an adult male, 26 March 1977 (Holland and Williams 1978, also in Bond 1980).

Guadeloupe - Sighting, in marshy vegetation, 20 Nov. 1969 (Guth 1971, also in Bond 1971).

Dominica - Sighting, of a male, 26 Jan. 1971 (by J. Terborgh, in Bond 1971).

Leucopeza semperi. Semper's Warbler.

This species is (or was) restricted in distribution to St. Lucia. It is one of the two wood warbler species closest to extinction in this century (the other being Vermivora bachmanii). It was described by Sclater (1876) on the basis of 2 specs. that he received from Semper (BMNH; also in Sharpe 1885). Danforth (1935a), summarizing knowledge of the bird to that date, indicated that it had apparently been more common in the past because older collectors seemed to have had no difficulty in obtaining specs., but that it had become very rare in this century. Peters collected a spec. (MCZ) on 20 March 1925, after which the bird was not seen in spite of considerable search until a spec. was collected on 15 April 1934. I do not believe that I have located this spec., although Danforth said it was in his personal collection, most of which reached the USNM. Danforth's bird is probably not among a number of undated specs. that I suspect are from the series collected by Semper around 1870, as suggested by Meyer de Schauensee (1941). According to Allen (1880), 8 specs. in the MCZ definitely fall into this category. There have been a few more recent sight reports, the first 2 by Stanley John, the same person who collected the spec. in 1934.. He saw 1 in a forest in March 1947 (Bond 1950) and then another on 21 May 1961 (Bond 1972). The last published sighting occurred on 14 Feb. 1972, when a pair of birds was observed from as close as 15 ft (Bond 1976). The American Ornithologists'

Union checklist (1983) described the bird as rare and local, but Bond (1986) wrote that he had "not received a satisfactory report of this warbler for many years." The only clue to its habitat is an anecdotal account of its presence "only in virgin forest at considerable altitudes" (Bond 1928, from a "reliable old pigeon hunter"). I have located a total of 32 specs. in the MCZ (9), AMNH (7), BMNH (6), USNM (5), and FM (5).

Wilsonia citrina. Hooded Warbler.

St. Martin - Sighting, 20 Oct. 1985 (Norton 1986b).

Saba - 1 spec., 6 March 1952 (ZMA; Voous 1955 collected this and saw several other inds. in the undergrowth of a high forest; also in Voous and Koelers 1967 and Voous 1983).

Antigua - Sightings: in Oct. and Nov. 1974 and again in Jan. 1975 (Holland and Williams 1978, also in Bond 1980).

Dominica - 1 spec., 10 Feb. 1964 (USNM; not in lit.).

Martinique - Pinchon (1961) noted a 24 Oct. 1957 spec. that is probably the same bird that Bond (1959) and Pinchon (1963) noted from a cacao plantation on 24 Nov. 1957. I have not located the spec.(s) and do not know which date is correct. Pinchon (1961) also indicated that Bond observed an ind. in Feb. 1959.

Wilsonia canadensis - Canada Warbler. Hypothetical.

Guadeloupe - Purportedly sighted by Dr. Colardeau sometime in the 1870's (noted by Danforth 1934, Bond 1950, and Pinchon 1963).

DISCUSSION

In summary, there have been 30 species of warblers reported from the Lesser Antilles. Five of these species are breeding residents and 26 are wintering migrants (the Yellow Warbler is included in both categories). Among the migrants, I have located specimens of 17 species. The remaining 9 species are included on the basis of sightings only, or, in the case of Oporornis agilis, of a somewhat questionable specimen that was not preserved. Some of these reports may be incorrect, and the status of a few species in the region is hypothetical.

The nine most common species of migrants are listed in sequence in Table 1. I assume that these species are all approximately as conspicuous and collectable as each other (Ovenbirds may perhaps be the most cryptic among those in Table 1). Also, I assume that collectors and authors have not been directing their attentions to certain species in preference over others. Although rarities tend to be noted with greater alacrity than the commonplace, this bias

Table 1. The most common migrant warbler species in the Lesser Antilles in terms of (1) the number of islands from which they have been reported, (2) the number of islands from which specimens (that I have located) exist, and (3) the total number of those specimens.

	# islands	# w/spec.	# specimens
<u>Setophaga ruticilla</u>	18	15	151
<u>Seiurus noveboracensis</u>	17	14	69
<u>Parula americana</u>	17	13	37
<u>Mniotilta varia</u>	15	7	30
<u>Seiurus aurocapillus</u>	14	6	17
<u>Dendroica discolor</u>	12	8	22
<u>Dendroica striata</u>	10	7	23
<u>Seiurus motacilla</u>	10	5	8
<u>Dendroica tigrina</u>	10	3	6

probably does not reduce the validity of the implications concerning the common birds listed in Table 1.

The numbers of species, resident and migrant, reported from each of the 25 main islands discussed, and the basis for their inclusion (e.g., number of specimens that I have located, specimens in the literature that I have not located, or sight reports) are presented in Table 2. The size and highest altitude of each island (from Lack 1976) are included. No obvious trends emerge from these data. The strongest correlations might lie between the migrant bird figures and such parameters as tourism intensity, population, accessibility, and hence the frequency with which islands have been visited by collectors.

For the most part, the common migrants in the Lesser Antilles are species that have widespread winter distributions. In fact, as this series of papers develops, it should become apparent that virtually all of these species are more abundant elsewhere. The only migrant species considered here that depend upon the Lesser Antilles may be the Blackpoll Warblers that use the islands as October stopover points on their way to South America. On the other hand, resident populations may be at significant risk. Semper's Warbler and the Yellow Warbler subspecies on Barbados may be extinct. Several other Yellow Warbler populations, some populations of the Plumbeous Warbler, and the Whistling Warbler may be endangered.

This paper summarizes the available data concerning the warblers of the Lesser Antilles. The occasional collection of specimens, clear and well-documented photographs, and accurate field-notes of observations that are incorporated into the literature or museum collections can legitimize range and date expansions that will add to our imperfect knowledge concerning this subject. Insight into ecological parameters such as habitat preference, foraging, mortality, and interspecific interactions, now practically nonexistent, should be developed. Most importantly, conservation efforts should be directed toward preserving endemic populations and appropriate habitats for migrants.

Table 2. The warbler avifauna of each of the Lesser Antilles. (Island areas and maximum altitudes are from Lack 1976). Species are listed according to the numbered code below. Lists are divided into resident species (R, with the number of specimens located) and migrant species based upon located specimens (M, with the number of specimens), specimens in the literature but not located (L), and published sight reports (O).

1 - <i>Vermivora peregrina</i>	16 - <i>D. plumbea</i>
2 - <i>Parula americana</i>	17 - <i>Catharopeza bishopi</i>
3 - <i>Dendroica petechia</i>	18 - <i>Mniotilta varia</i>
4 - <i>D. pensylvanica</i>	19 - <i>Setophaga ruticilla</i>
5 - <i>D. magnolia</i>	20 - <i>Protonotaria citrea</i>
6 - <i>D. tigrina</i>	21 - <i>Helmitheros vermivorus</i>
7 - <i>D. caerulescens</i>	22 - <i>Seiurus aurocapillus</i>
8 - <i>D. coronata</i>	23 - <i>S. noveboracensis</i>
9 - <i>D. virens</i>	24 - <i>S. motacilla</i>
10 - <i>D. fusca</i>	25 - <i>Oporornis formosus</i>
11 - <i>D. dominica</i>	26 - <i>O. agilis</i>
12 - <i>D. adelaidae</i>	27 - <i>Geothlypis trichas</i>
13 - <i>D. discolor</i>	28 - <i>Leucopeza semperi</i>
14 - <i>D. castanea</i>	29 - <i>Wilsonia citrina</i>
15 - <i>D. striata</i>	30 - <i>W. canadensis</i>

Table 2. (cont.)

Sombrero (area ?; max. altitude ?)

O - 19

Anguilla (90 sq km; "low" in altitude)

R - 3(12)

M - 15(2), 2(1), 13(1), 22(1)

O - 18, 19, 20, 23

St. Martin (85 sq km; 410 m max altitude)

R - 3(8)

M - 23(3), 2(4), 19(4), 15(1)

L - 22

O - 5, 7, 9, 13, 18, 20, 21, 24, 26, 29

St. Barthelemy (25 sq km; 300 m max)

R - 3(4)

M - 2(2)

L - 24

Barbuda (160 sq km; "low")

R - 3(14), 12(39)

M - 23(8), 19(6), 13(4), 18(3), 2(2), 22(1)

O - 6, 9, 20, 24

Table 2. (cont.)

Saba (12 sq km; 860 m max)

M - 2(3), 13(2), 19(2), 29(1)

O - 18, 23

St. Eustasius (21 sq km; 600 m max)

R - 3(35)

M - 19(10), 2(5), 13(5), 18(2), 22(1)

O - 15

St. Kitts (180 sq km; 1140 m max)

R - 3(51)

M - 19(17), 2(9), 18(4), 13(4), 23(3), 6(1), 22(1), 24(1)

Nevis (130 sq km; 1100 m max)

R - 3(12)

M - 23(1)

O - 2, 13, 18, 19

Antigua (280 sq km; 400 m max)

R - 3(69)

M - 19(18), 23(14), 22(12), 18(10), 13(4), 24(3), 15(1)

O - 2, 4, 5, 6, 7, 8, 9, 14, 21, 25, 27, 29

Table 2. (cont.)

Montserrat (100 sq km; 910 m max)

R - 3(9)

M - 2(4), 19(2), 11(1), 13(1), 18(1), 23(1), 24(1)

L - 6

O - 20, 22

Guadeloupe (1500 sq km; 1500 m max)

R - 3(72), 16(75)

M - 19(13), 18(6), 23(7), 15(3), 2(2), 6(2), 9(2), 24(2)

O - 7, 11, 22, 25, 27, 30

La Desirade (27 sq km; 280 m max)

R - 3(1)

Les Saintes (???)

R - 3(7), 16(0)

O - 22

Marie Galante (24 sq km; "low")

R - 3(6), 16(8)

M - 19(2)

O - 18

Table 2. (cont.)

Dominica (800 sq km; 1450 m max)

R - 3(88), 16(107)

M - 19(19), 23(6), 18(4), 2(2), 9(1), 29(1)

O - 6, 7, 22, 24, 27

Martinique (1100 sq km; 1340 m max)

R - 3(76)

M - 19(11), 23(5), 2(1), 13(1), 20(1)

L - 29

O - 6, 10, 15, 18, 22

St. Lucia (600 sq km; 960 m max)

R - 3(26), 12(114), 28(32)

M - 19(35), 23(9), 15(4), 6(3), 2(1), 20(1), 22(1)

O - 18

Barbados (430 sq km; 340 m max)

R - 3(62)

M - 19(4), 23(3), 5(1), 8(1)

L - 2, 15, 22

O - 1, 4, 6, 9, 13, 14, 18, 20, 24

Table 2. (cont.)

St. Vincent (350 sq km; 1240 m max)

R - 17(31)

M - 19(5), 2(1), 15(1), 23(1), 24(1)

O - 3, 6, 14, 22

Mayero (??)

R - 3(2)

Union Island (??)

R - 3(4)

M - 3(1), 23(1)

Prune Island (??)

R - 3(23)

Carriacou (34 sq km; 300 m max)

R - 3(5)

O - 23

Grenada (310 sq km; 840 m max)

R - 3(1)

M - 15(11), 23(7), 3(3), 19(3), 10(1), 20(1)

O - 2, 13

LITERATURE CITED

- Aldrich, J. W. 1942. Specific relationships of the Golden and Yellow Warblers. Auk 59:447-449.
- Allen, J. A. 1880. List of the birds of the island of Santa Lucia, West Indies. Bull. Nuttall Ornithol. Club 5:163-169.
- _____. 1881. Supplementary list of birds of the island of Santa Lucia, W. I. Bull. Nuttall Ornithol. Club 6:128.
- American Ornithologists' Union. 1983. Check-list of North American birds. 6th ed. American Ornithologists's Union, Washington, D.C. 877 p.
- Andrle, R. F. and P. R. Andrle. 1976. The Whistling Warbler of St. Vincent, West Indies. Condor 78:236-243.
- Bent, A. C. 1953. Life histories of North American wood warblers. Bull. U.S. Nat. Mus. 203:1-734.
- Bond, J. 1927. A new Golden Warbler from the island of St. Lucia, B.W.I. Auk 44:571-572.
- _____. 1928. On the birds of Dominica, St. Lucia, St. Vincent and Barbados, B.W.I. Proc. Acad. Nat. Sci. Philadelphia 80:523-545.
- _____. 1930. The resident West Indian warblers of the genus Dendroica. Proc. Acad. Nat. Sci. Philadelphia 82:329-337.
- _____. 1939a. Notes on birds from the West Indies and other Caribbean islands. Notulae Naturae 13:1-6.

- _____. 1939b. Some birds from Montserrat, British West Indies. Auk 56:193-195.
- _____. 1941. Nidification of the birds of Dominica, B.W.I. Auk 58:364-375.
- _____. 1942. Additional notes on West Indian birds. Proc. Acad. Nat. Sci. Philadelphia 94:89-106.
- _____. 1950. Check-list of birds of the West Indies. 3rd ed. Wickersham Printing Co., Lancaster, Pa. 200 p.
- _____. 1951. First supplement to the check-list of birds of the West Indies. Acad. Nat. Sci. Philadelphia. 22 p.
- _____. 1952. Second supplement to the check-list of birds of the West Indies (1950). Acad. Nat. Sci. Philadelphia. 24 p.
- _____. 1956. First supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 8 p.
- _____. 1957. Second supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 14 p.
- _____. 1958. Third supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 11 p.
- _____. 1959. Fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 12 p.

- _____. 1961. Sixth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 12 p.
- _____. 1962. Seventh supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 11 p.
- _____. 1964. Ninth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 13 p.
- _____. 1965. Tenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 16 p.
- _____. 1968. Thirteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 12 p.
- _____. 1969. Fourteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 10 p.
- _____. 1970. Fifteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 15 p.
- _____. 1971. Sixteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 15 p.
- _____. 1972. Seventeenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 11 p.

- _____. 1973. Eighteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 12 p.
- _____. 1974. Nineteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 12 p.
- _____. 1976. Twentieth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 14 p.
- _____. 1977. Twenty-first supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 16 p.
- _____. 1978. Twenty-second supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 20 p.
- _____. 1979. Derivations of Lesser Antillean birds. Proc. Acad. Nat. Sci. Philadelphia 131:89-103.
- _____. 1980. Twenty-third supplement to the check-list of birds of West Indies (1956). Acad. Nat. Sci. Philadelphia. 14 p.
- _____. 1982. Twenty-fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 16 p.
- _____. 1984. Twenty-fifth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 22 p.

- _____. 1986. Twenty-sixth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Philadelphia. 18 p.
- Brodkorb, P. 1931. Description of a new warbler from Guadeloupe, West Indies. Proc. Biol. Soc. Washington 44:3-4.
- Clark, A. H. 1905a. A supposed specimen of the Yellow Warbler (Dendroica aestiva) from Grenada, West Indies. Auk 22:212-214.
- _____. 1905b. Birds of the southern Lesser Antilles. Proc. Boston Soc. Nat. Hist. 32:203-312.
- _____. 1905c. The Redstart (Setophaga ruticilla) a resident in Dominica, West Indies. Auk 22:419.
- _____. 1905d. The birds of St. Vincent. West Indian Bull. 5:75-95.
- _____. 1911. A list of the birds of the island of St. Lucia. West Indian Bull. 11:182-192.
- Cory, C. B. 1886a. The birds of the West Indies, including the Bahama Islands, the Greater and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Part I. Auk 3:1-59.
- _____. 1886b. On a collection of birds from several little-known islands of the West Indies. Ibis 1886:471-475.
- _____. 1887. A list of the birds collected by Mr. W. B. Richardson, in the island of Martinique, West Indies. Auk 4:95-96.

- _____. 1891a. A collection of birds taken by Cyrus B. Winch in the islands of Anguilla, Antigua, and St. Eustasius, West Indies, during April, May, June and a part of July, 1890. Auk 8:46-47.
- _____. 1891b. A list of the birds collected in the islands of St. Croix and St. Kitts, West Indies, during March and April, and in Guadeloupe during August, September, and October, 1890. Auk 8:47-49.
- _____. 1892. Catalogue of West Indian birds, containing a list of all species known to occur in the Bahama Islands, the Greater Antilles, the Caymans, and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Published by the author, Boston. 163 p.
- Danforth, S. T. 1930. Notes on the birds of St. Martin and St. Eustasius. Auk 47:44-47.
- _____. 1934. The birds of Antigua. Auk 51:350-364.
- _____. 1935a. The birds of Saint Lucia. Monogr., Univ. Puerto Rico, series B, no. 3. 129 p.
- _____. 1935b. The birds of Barbuda, with notes on their economic importance, and relationship to the Puerto Rican avifauna. J. Agric. Univ. Puerto Rico 19:473-482.
- _____. 1936. The birds of St. Kitts and Nevis. Trop. Agric. 13:213-217.
- _____. 1938. The birds of Saba. J. Agric. Univ. Puerto Rico 22:503-512.
- _____. 1939a. The birds of Guadeloupe and adjacent islands. J. Agric. Univ. Puerto Rico 23:9-46.

- _____. 1939b. The birds of Montserrat. J. Agric. Univ. Puerto Rico 23:47-66.
- _____. 1939c. Supplement to 'The birds of Antigua.' Auk 56:304-305.
- Diamond, A. W. 1973. Habitats and feeding stations of St. Lucia forest birds. Ibis 115:313-329.
- Eisenmann, E. 1955. Status of the Black-pollled, Bay-breasted, and Connecticut Warblers in Middle America. Auk 72:206-207.
- Feilden, H. W. 1889. On the birds of Barbados. Ibis 1889:477-503.
- Guth, R. W. 1971. New bird records from Guadeloupe and its dependencies. Auk 88:180-182.
- Hellmayr, C. E. 1935. Catalogue of birds of the Americas and adjacent islands. Field Museum Nat. Hist., Zool. Ser. 13, Part 8:1-541.
- Hilditch, C. D. M., T. C. Williams and I. C. T. Nisbet. 1973. Autumnal bird migration over Antigua, W.I. Bird-Banding 44:171-179.
- Holland, C. S. and J. M. Williams. 1978. Observations on the birds of Antigua. Amer. Birds 32:1095-1105.
- Hoogerwerf, A. 1977. Notes on the birds of St. Martin, Saba and St. Eustasius. Studies Fauna of Curacao & other Carib. islands 54:60-123.
- Kepler, C. B. and K. C. Parkes. 1972. A new species of warbler (Parulidae) from Puerto Rico. Auk 89:1-18.

- Lack, D. 1976. Island biology illustrated by the land birds of Jamaica. Univ. Calif. Press, Berkeley. 445 p.
- _____ and A. Lack. 1973. Birds on Grenada. Ibis 115:53-59.
- _____, E. Lack, P. Lack and A. Lack. 1973. Birds on St. Vincent. Ibis 115:46-52.
- Lanyon, W. E. and J. Bull. 1967. Identification of Connecticut, Mourning, and MacGillivray's Warblers. Bird-Banding 38:187-194.
- Lawrence, G. N. 1867. Catalogue of birds collected at the island of Sombrero, W.I., with observations by A. A. Julien. Ann. Lyceum Nat. Hist. New York 8:92-106.
- _____. 1868. Description of seven new species of American birds from various localities, with a note on Zonotrichia melanotis. Proc. Acad. Nat. Sci. Philadelphia 1868:359-361.
- _____. 1878a. Catalogue of the birds of Dominica from collections made for the Smithsonian Institution by Frederick A. Ober, together with his notes and observations. Proc. U.S. Nat. Mus. 1:48-69.
- _____. 1878b. Catalogue of the birds of St. Vincent, from collections made by Mr. Fred A. Ober, under the directions of the Smithsonian Institution, with his notes thereon. Proc. U.S. Nat. Mus. 1:185-198.
- _____. 1878c. Catalogue of the birds of Antigua and Barbuda, from collections made for the Smithsonian Institution, by Mr. Fred A. Ober, with his observations. Proc. U.S. Nat. Mus. 1:232-240.

- _____. 1878d. Catalogue of the birds collected in Martinique by Mr. Fred A. Ober for the Smithsonian Institution. Proc. U.S. Nat. Mus. 1:349-360.
- _____. 1878e. Descriptions of new species of birds from the island of Dominica. Ann. New York Acad. Sci. 1:46-49.
- _____. 1879a. Catalogue of the birds of Grenada, from a collection made by Mr. Fred A. Ober for the Smithsonian Institution, including others seen by him, but not obtained. Proc. U.S. Nat. Mus. 1:265-278.
- _____. 1879b. Catalogue of a collection of birds obtained in Guadeloupe for the Smithsonian Institution, by Mr. Fred A. Ober. Proc. U.S. Nat. Mus. 1:449-462.
- _____. 1886. List of a few species of birds new to the fauna of Guadeloupe, West Indies, with a description of a new species of Ceryle. Proc. U.S. Nat. Mus. 8:621-625.
- Lister, C. E. 1880. Field-notes on the birds of St. Vincent, West Indies. Ibis 1880:38-44.
- Lowery, G. H., Jr., and B. L. Monroe, Jr. 1968. Family Parulidae. P. 3-93 in R. A. Paynter, Jr., ed., Checklist of birds of the world, Vol. 14. Harvard Univ. Press, Cambridge, Mass.
- Meyer de Schauensee, Rodolphe. 1941. Rare and extinct birds in the collections of the Academy of Natural Sciences of Philadelphia. Proc. Acad. Nat. Sci. Philadelphia 93:281-324.

- Morris, M. M. J. and R. E. Lemon. 1985. An avian survey of a coastal scrub area, St. Kitts, West Indies. *Studies on Neotropical Fauna and Environment* 20:59-64.
- Nicoll, M. J. 1904. On a collection of birds made during the cruise of the 'Valhalla', R.Y.S., in the West Indies (1903-4). *Ibis* 1904:555-591.
- Noble, G. K. 1916. The resident birds of Guadeloupe. *Bull. Mus. Comp. Zool.* 60:357-396.
- Nolan, V., Jr. 1978. The ecology and behavior of the Prairie Warbler Dendroica discolor. *Ornithol. Monogr.* 26:1-595.
- Norton, R. L. 1981. The autumn migration: West Indies region. *Amer. Birds* 35:231-232.
- _____. 1983. The spring migration: West Indies region. *Amer. Birds* 37:916-917.
- _____. 1984. The spring migration: West Indies region. *Amer. Birds* 38:968-970.
- _____. 1986a. The autumn migration: West Indies region. *Amer. Birds* 40:163-164.
- _____. 1986b. The spring migration: West Indies region. *Amer. Birds* 40:528-529.
- Olson, S. L. 1980. Geographic variation in the Yellow Warblers (Dendroica petechia: Parulidae) of the Pacific coast of Middle and South America. *Proc. Biol. Soc. Washington* 93:473-480.
- Pashley, D. N. and R. P. Martin. 1988. The contribution of Christmas Bird Counts to knowledge of the winter

- distribution of migratory warblers in the Neotropics.
Amer. Birds 42:1164-1176.
- Peters, J. L. 1926. A new race of the Golden Warbler from the West Indies. Proc. New England Zool. Club 9:41.
- _____. 1927a. A revision of the Golden Warblers, Dendroica petechia (Linne). Proc. Biol. Soc. Washington 40:31-41.
- _____. 1927b. Birds of the island of Anguilla, West Indies. Auk 44:532-538.
- Pinchon, R. 1961. Deuxieme note complementaire sur l'avifaune des Antilles Francaises. L'Oiseau et R.F.O. 31:85-99.
- _____. 1963. Faune des Antilles Francaises. Les oiseaux. MM. Ozanne et Cie., Caen, France. 264 p.
- Ridgway, R. 1883. Description of a new warbler from the island of Santa Lucia, West Indies. Proc. U.S. Nat. Mus. 5:525-526.
- _____. 1889. Scientific results of explorations by the U.S. Fish Commission steamer Albatross. No. II.- Birds collected on the island of Santa Lucia, West Indies, the Abrolhos Islands, Brazil, and at the Straits of Magellan in 1887-88. Proc. U.S. Nat. Mus. 12:129-139.
- _____. 1902. The birds of North and Middle America. Part II. Bull. U.S. Nat. Mus. 50:1-834.
- Riley, J. H. 1904. Catalogue of a collection of birds from Barbuda and Antigua, British West Indies. Smithsonian Inst. Misc. Coll. 47:277-291.

- Salvin, O. 1874. A visit to the principal museums of the United States, with notes on some of the birds contained therein. *Ibis* 1874:305-329.
- Schreiber, R. W. and E. A. Schreiber. 1984. Mensural and moult data for some birds of Martinique, French West Indies. *Bull. Brit. Ornithol. Club* 104:62-68.
- Schwartz, A. and R. F. Klinikowski. 1963. Observations on West Indian birds. *Proc. Acad. Nat. Sci. Philadelphia* 115:53-77.
- _____ and _____. 1965. Additional observations on West Indian birds. *Notulae Naturae* 376:1-16.
- Sclater, P. L. 1871. On the birds of the island of Santa Lucia, West Indies. *Proc. Zool. Soc. London* 1871:263-273.
- _____. 1874. On a small collection of birds from Barbadoes, West Indies. *Proc. Zool. Soc. London* 1874:174-175.
- _____. 1876. On some additional species of birds from St. Lucia, West Indies. *Proc. Zool. Soc. London* 1876:13-14.
- _____. 1889a. List of birds collected by Mr. Ramage in Dominica, West Indies. *Proc. Zool. Soc. London* 1889:326-327.
- _____. 1889b. List of birds collected by Mr. Ramage in St. Lucia, West Indies. *Proc. Zool. Soc. London* 1889:394-395.

- _____. 1892. On a collection of birds from the island of Anguilla, West Indies. Proc. Zool. Soc. London 1892:498-500.
- Semper, J. E. and P. L. Sclater. 1872. Observations on the birds of St. Lucia. Proc. Zool. Soc. London 1872:647-653.
- Sharpe, R. B. 1885. Catalogue of birds in the British Museum. Vol. 10. The British Museum, London. 682 p.
- Taylor, E. C. 1864. Five months in the West Indies. Part II - Martinique, Dominica, and Porto Rico. Ibis 6:157-173.
- Terborgh, J. 1973. Chance, habitat and dispersal in the distribution of birds in the West Indies. Evolution 27:338-349.
- _____, J. Faaborg and H. J. Brockmann. 1978. Island colonization by Lesser Antillean birds. Auk 95:59-72.
- Vaurie, C. 1961. List of and notes on the birds of the Iles des Saintes, French West Indies. Auk 78:57-62.
- Verrill, G. E. 1892. Notes on the fauna of the island of Dominica, British West Indies, with lists of the species obtained and observed by G. E. and A. H. Verrill. Trans. Connecticut Acad. Arts and Sci. 8:315-355.
- Voous, K. 1955. The birds of St. Martin, Saba, and St. Eustasius. Studies Fauna of Curacao and other Carib. islands 6:1-82.

- _____. 1983. Birds of the Netherland Antilles. 2nd ed.
DeWalburg Pers, Utrecht. 327 p.
- _____ and H. J. Koelers. 1967. Check-list of the birds of
St. Martin, Saba, and St. Eustasius. Ardea 55:115-137.
- Wells, J. G. 1886. A catalogue of the birds of Grenada,
West Indies, with observations thereon. Proc. U.S. Nat.
Mus. 9:609-633.
- _____. 1902. The birds of the island of Carriacou. Part
II. Land birds. Auk 19:343-349.
- Wetmore, A. 1949. Geographical variation in the American
Redstart (Setophaga ruticilla). J. Washington Acad.
Sci. 39:137-139.

WARBLERS OF THE WEST INDIES

IV. THE BAHAMA ISLANDS

This is the fourth in a series of papers dealing with the distribution and natural history of wood-warblers (Emberizidae: Parulinae) in the West Indies. The primary sources of data are the specimens housed in 37 museum collections. These have been supplemented by information from published literature.

Within each species account, islands are discussed in a sequence roughly from northwest to southeast. San Salvador has been called Watling's Island in much of the literature, Hog Island has been recently renamed Paradise Island, and Cay Sal has been called Salt Cay. Because some island names recur through the Bahamas, and because other names on specimen tags are not now or perhaps never were widely used, the localities of a few records are in doubt. These will be indicated in the text.

The museum that houses each specimen and any references to those specimens are included within parentheses after the date of collection. If literature citations are not given, then the data given are formally presented for the first time. In many cases, although there are references to the existence of specimens (such as by Cory, Riley 1905, Hellmayr 1935, and to some extent Buden 1987a), specific data concerning dates or numbers have not been previously reported.

General comments can clarify information in a few frequently used references. Near the turn of the century, J. Lewis Bonhote solicited lighthouse-keepers throughout the Bahamas to record the migrant birds that hit their lighthouses. Theo. Thompson, stationed at Cay Lobos and later at Bird Rock (off Crooked Island) and Cay Sal, sent reports and wings to Bonhote. Results were published by Bonhote (1901 and 1903b), but to my knowledge, wings were not preserved.

Many of the specimens collected for Charles B. Cory of the Field Museum in or shortly after 1890 bear only the location "Caicos" on labels. Cory and others subsequently published lists of some of these species variously from West, North, East, and South Caicos as well as from Middle Caicos, presumably on the basis of field notes that I have not seen. For the sake of consistency, I include the specimens labeled "Caicos" under Middle Caicos. Some (or perhaps all) of the reports from the other Caicos Islands are substantiated by specimens.

For the sake of brevity, certain terms are hereafter abbreviated throughout (spec.[s] = specimen[s]; ind.[s] = individual[s]). Museum names are also abbreviated after their first appearance in the text.

Data from Christmas Bird Counts (CBC's) have also been included. There has been one CBC in the Abaco group (Green Turtle Cay 1974), 5 on Andros (Staniard Creek 1984, 1985, 1986; San Andros 1985, 1986), 5 on Eleuthera (Gregory Town

1976; Governor's Harbor 1976, 1977, 1978, and 1985), and one on Grand Turk (1985).

SPECIES ACCOUNTS

Vermivora bachmanii - The winter range of Bachman's Warbler is (or was) limited to Cuba; inds. apparently have passed over the western Bahamas in transit.

Cay Sal - A bird struck the lighthouse on Cay Sal on 13 March 1901 (Bonhote 1903b). Although the spec. was not preserved, it served as the basis for listing by Cooke (1904), Riley (1905a), Hellmayr (1935), Buden and Schwartz (1968), Brudenell-Bruce (1975), and Buden (1987b). This island lies almost directly between southern Florida and Cuba.

Vermivora pinus - Blue-winged Warbler. There is at least one report from every month between 18 Sept. and 6 May.

Grand Bahama - Sighting, Nov. 1959 (Bond 1960); bandings: 1 ind. in or before 1980 (Bond 1980) and another on 6 May (Bond 1982).

Abaco - 1 spec. reported (not located), either 7 April (as in Ridgway 1891) or 9 April (Ridgway 1902). Listed by Cory (1892a), Riley (1905a), Hellmayr (1935), and Bond (1950). Conklin (1970) found a post-Colombian fossil in a cave.

New Providence - 1 banded, 2 Oct. 1959 (Bond 1960).
Noted as a rare passage migrant by Brudenell-Bruce (1975)
from 17 Sept. to 2 Oct. and from 28 Feb. to 12 April.

Eleuthera - Sightings: 18 Sept. 1976, 11 Oct. 1976, and
17 Dec. 1978 (Connor and Loftin 1985), 11 Feb. (Norton
1986b), and several in March, as late as the 21st (Norton
1986c).

Cat Island - 1 spec., 28 Nov. 1963 (Louisiana State
University Museum of Zoology [LSU]; Paulson 1966). In
noting this spec., Buden (1987) wrote that "the lack of
winter records of this and other warbler species should not
suggest that many are not common during that season."

San Salvador - 1 spec., 1 Jan. 1964 (LSU; Paulson
1966).

Providenciales - Sightings: 6 March (Norton 1982b), 9
Jan. 1983 (Norton 1983, Buden 1987a), 30 March 1975 (Buden
1987a), and 21 Oct. 1986 (Norton 1987a); 1 ind. netted and
photographed, 15 April 1975 (Buden 1987a noted that this may
be the same bird seen there in March).

Vermivora chrysoptera - Golden-winged Warbler.

Grand Bahama - Sighting, 10 March 1968 (Emlen 1977); 1
banded (Bond 1980).

New Providence - Sightings: 22 Sept. and 14 Oct. 1962
(Brudenell-Bruce 1975).

Eleuthera - Sightings: 22 Sept. 1956 (Bond 1957) and 27
Sept. 1978 (Connor and Loftin 1985).

Providenciales - Sighting, 17 Oct. 1986 (Norton 1987a).

Vermivora peregrina - Tennessee Warbler. There are reports from early Oct. to late Dec. as well as several in April. Cory (1886) included this species in his Bahamas list based upon a spec. labeled only "Bahama I."

Grand Bahama - 1 ind. netted, 22 Oct. (Bond 1972); by 1980, a total of 26 inds. had been banded (Bond 1980). Sightings: Nov. 1959 (Bond 1960), 29 Nov. 1986 (Norton 1987a), and early Oct. 1987 (Norton 1988a).

Great Abaco - Sightings, 11 and 30 Dec. (Norton 1984a).

Bimini - Sighting, 7 April 1958 (Bond 1959).

Andros - Sightings: at least 5 inds., 23-25 Nov. 1964 (Bond 1965), and 1 ind. in early Nov. 1968 (Bond 1969).

New Providence - Sighting, 2 Oct. 1960 (Bond 1961). Noted from 5-28 Oct. by Brudenell-Bruce (1975).

Eleuthera - Sighting, offshore on Harbor Island, Nov. 1961 (Bond 1962). Eleuthera sightings: 10 Nov. 1962 (Bond 1963) and 21 Feb. (Norton 1986a). Connor and Loftin (1985) considered it an uncommon fall transient from 12 Sept.-18 Nov.

Cay Sal - Sighting, 20 April (Buden and Schwartz 1968, also in Buden 1987b).

Crooked Island - Sighting, 28 Oct. 1981 (Norton 1982a, Buden 1987a).

Mayaguana - 1 spec., 13 Oct. 1976 (LSU; Buden 1987a collected this and saw several others during that month).

Providenciales - Sightings: 28 April 1982 (Norton 1982b, Buden 1987a) and from 20 Oct.-4 Nov. 1986 (Norton 1987a).

Vermivora c. celata - Orange-crowned Warbler. Most reports come from Nov.; the single spec. is from Jan.

Grand Bahama - Sightings: 12-15 Nov. 1959 (Bond 1960) and 16 Oct. 1965 (Bond 1966). Emlen (1977) considered it a winter resident in mangroves and submature pines (density - $0.67/\text{km}^2$).

Abaco - Listed by Brudenell-Bruce (1975).

Andros - Sighting, early Nov. 1968 (Bond 1969).

New Providence - 1 ind. banded, 22 Nov. 1963 (Bond 1964, Brudenell-Bruce 1975); sightings: 2 Jan. 1968 (Bond 1968) and 21 Oct. (Brudenell-Bruce 1975).

Eleuthera - Sightings: 27 Nov. 1964 (Bond 1965) and 6 or 7 birds in late Nov. on Harbor Island (Bond 1967). Connor and Loftin (1985) considered it an uncommon winter resident from 29 Sept.-13 May.

San Salvador - 1 spec., 1 Jan. 1974 (LSU; Paulson 1966).

Vermivora ruficapilla - Nashville Warbler. The few reports are from Oct.-Dec., concentrated in Nov., and from Feb.-April, concentrated in March.

Grand Bahama - Sighting, 9-12 Oct. 1964 (Bond 1965). 1 ind. banded 12 Feb. and recaptured 16 March, and others

banded up until 22 March (Bond 1972); a total of 6 had been banded at one locale by 1980 (Bond 1980).

Andros - Sighting, 27 Nov. (Bond 1969). Reported in the 1986 CBC.

New Providence - 1 spec. reported, 1 Oct. (Bond 1962, not located). Noted as a rare passage migrant by Brudenell-Bruce (1975) from 30 Sept. to 25 Oct.

Eleuthera - Connor and Loftin (1985) considered this a "scarce fall migrant from 18 Sept. to 31 Oct." Sighting, 7 March (Norton 1986b).

San Salvador - Sightings: 13 widely scattered inds., 28 Nov.-10 Dec. 1975 and 1 on 21 Nov. 1976 (Miller 1978). 1 ind. photographed in Dec. (Bond 1980).

Exuma - Sighting, undated, Great and/or Little Exuma (Bond 1968).

Providenciales - Sightings: 25 April 1982 (Norton 1982b [Buden 1987a considered this report "in need of corroboration"]), 1 ind. from 25-31 March (Norton 1985b), and on 29 Sept. 1987 (Norton 1988a).

North Caicos - Sighting, 30 Sept. 1987 (Norton 1988a).

Parula americana - Northern Parula. The earliest spec. date is 22 Sept. and the latest is 2 May (there is a later lighthouse-kill report on 14 May); there are a number of specs. from all intervening months.

Grand Bahama - 12 specs.: 10 from 23 Dec. 1891-29 Jan. 1892 (Field Museum of Natural History [FM]; Hellmayr 1935

noted 13 FM specs.), and 1 each from 26 April 1946 (Carnegie Museum of Natural History [CM]) and 31 Jan. 1968 (LSU;). 14 tower-kills, 22 Oct. 1966 (Kale et al. 1969). Noted as a winter resident primarily in coppets (thick growths of shrubbery in soil in crevices of the otherwise dominant limestone surface) at a density of $6.8/\text{km}^2$ (Emlen 1977). Listed by Cory (1892a) and Riley (1905).

Abaco - Reported on the 1974 CBC.

Walker Cay - 1 spec., 11 Feb. 1942 (CM;).

Bimini - 3 specs., all 21-26 March 1891 (FM; Cory 1891b, Hellmayr 1935). Subsequently listed by Cory (1892a), Riley (1905a), and Vaurie (1953).

Berry Islands - Spec.(s) reported (Cory 1891b, not located); listed by Cory (1892a) and Riley (1905a).

Andros - 5 specs. located: 4 from 25 Nov.-18 Dec. 1887 (FM; Hellmayr 1935 noted 6 FM specs.) and 1 from 23 Nov. 1960 (LSU;). Northrop (1891) collected specs. on 26 March and 19 April 1890 (not located); he considered the species uncommon. Noted by Todd and Worthington (1911; as uncommon) and listed by Cory (1892a), Cooke (1904), and Riley (1905a). Walkinshaw and Walkinshaw (1961) noted 13 observations from 16-26 March 1960. Reported in 5/5 CBC's.

New Providence - 8 specs. located: 1 from 21 Jan. 1879 (FM; Hellmayr 1935), 3 inds. from 15-16 April 1886 (United States National Museum [USNM]; Ridgway 1891), 2 from 29 April 1898 (1 in the American Museum of Natural History [AMNH], the other in the British Museum [Natural History])

[BMNH]), and 1 each on 21 Oct. and 25 Nov. 1898 (again, 1 each in AMNH and BMNH; the last 4 plus another from 30 April [not located] were collected by Bonhote 1899; he indicated that this species is "met with only on passage"). Bonhote (1903a) collected another spec. on 19 April 1902 (not located). Brudenell-Bruce (1975) listed 21 Aug. and 13 May as extreme dates. The first published sighting was by Bryant (1866); listed by Cory (1890, 1892a) and Riley (1905a).

Eleuthera - 6 specs., all from 16-25 Nov. 1891 (FM; Hellmayr 1935). Connor and Loftin (1985) described this as a common winter resident found throughout the island from 25 Aug.-28 April. Listed by Cory (1892a) and Riley (1905a). Reported in 5/5 CBC's.

San Salvador - 6 specs., all from 6-17 Oct. 1891 (5 FM, 1 BMNH; Cory 1892b noted 5 specs., but from a broader range of dates [28 Sept.-9 Nov.]; Hellmayr 1935 noted the FM specs.). Bent (1953) indicated that Cory's (probably incorrect) 28 Sept. was an early fall date. Listed by Cory (1892a) and Riley (1905a).

Cay Sal - 1 spec., 20 April 1968 (LSU; Buden and Schwartz 1968 collected this and reported that a large wave arrived on the previous night and that inds. were seen regularly thereafter). 8 inds. struck the lighthouse on 13 March 1901 (Bonhote 1903b). Listed by Riley (1905a) and Buden (1987b).

Green Cay - 1 spec., 12 April 1886 (USNM; Ridgway 1891). Listed by Cory (1892a) and Riley (1905a).

Rum Cay - 1 spec., 21 March 1886 (USNM; Ridgway 1891). Listed by Cory (1892a) and Riley (1905a).

Cay Lobos - Birds struck the lighthouse on 1 and 25 March and 1 and 2 May 1900 (Bonhote 1901), on 20 and 29 Oct. and 22 Nov. 1900, and on 21, 23, and 25 March, 11 and 15 April, and 13 and 14 May 1901 (Bonhote 1903b). Listed by Riley (1905a) and Bent (1953).

Crooked Island - Listed by Buden (1987a).

Acklins Island - Listed by Buden (1987a).

East Plana Cay - Several sightings, Oct. 1967 (Clough and Fulk 1971). Listed by Buden (1987a).

Mayaguana - 1 spec., 20 Oct. 1976 (LSU). Listed by Buden (1987a).

Great Inagua - 10 specs.: 1 on 16 Feb. 1888, 2 on 1 March 1891, 3 from 27-30 April 1891, 2 from 1-2 May 1891, and 1 ind. on 22 Sept. 1891 (all FM; Hellmayr 1935), and 1 on 10 Feb. 1909 (CM; Todd and Worthington 1911). Observed by Bryant (1866) and listed by Cory (1892a), Riley (1905a), Bond (1950), and Buden (1987a).

Little Inagua - Listed by Buden (1987a).

Providenciales - Inds. banded, 4 Dec. 1980 (recaptured 15 Jan. 1982) and 13 Dec. 1983 (recaptured 21 March 1984) (Buden 1987a).

North Caicos - Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Middle Caicos - Spec.(s) reported, Jan. or Feb. 1891 (Cory 1891). Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

East Caicos - Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Grand Turk - Sighting, 22 Sept. 1977 (Buden 1987a).

Dendroica petechia gundlachi - Yellow Warbler. The breeding subspecies of the Bahamas was initially thought to be identical to that described from Cuba, D. p. gundlachi. Chapman (1892) compared material from Rum Cay, Cuba, Jamaica, and Grand Cayman, and concluded that the Bahaman birds were distinct enough to merit subspecific status as D. p. flaviceps. Bond (1942) pointed out, however, that Jamaican and Cayman birds were a distinct subspecies (D. p. eoa) and that the only relevant comparison was between Bahaman and Cuban birds. Bond felt that birds from these islands were indistinguishable from each other, and that gundlachi should apply thereafter to both.

Yellow Warblers appear to be uncommon on the northern Bahamas, with the possible exception of Great Abaco, and considerably more common on the southern islands.

Besides the specs. listed below, there is 1 from Cayete Island (USNM), 2 from Rail Cay (Museum of Comparative Zoology, Harvard [MCZ]; I could not locate either island), and 3 from unknown localities.

All specs. are presumed to be gundlachi rather than migrants from the mainland. Bryant (1866) tentatively identified 2 New Providence specs. as migrants and Connor and Loftin (1985) noted a migrant on Eleuthera from 17 Aug.-4 Nov.; there are no other reports.

Grand Bahama - 2 specs., 22 June 1891 (FM; Cory 1891d, Hellmayr 1935). Emlen (1977) found it infrequently in mangroves. Listed by Cory (1892a) and Riley (1905a).

Great Sale Cay - Sighting, July 1904 (Allen 1905).

Fish Cay - 2 specs., 11 July 1930 (USNM).

Moraine Cay - Sighting, July 1904 (Allen 1905).

Little Abaco - 2 specs. located, 21 and 31 March 1902 (1 AMNH, 1 BMNH; Bonhote 1903 listed 3 specs. from this period). Listed by Riley (1905a).

Great Abaco - 11 specs.: 4 from 17-24 March 1891 (FM; Hellmayr 1935), 4 from 3-29 April 1946 (CM), and 3 from 12-14 April 1965 (LSU). Sightings: 6 July 1904 (in mangroves, Allen 1905) and in April 1909 (Todd and Worthington 1911). Paulson (1966) wrote that these birds may be more common on Abaco than elsewhere in the northern Bahamas. Listed by Cory (1892a) and Riley (1905a).

Elbow Cay - 3 specs., 4-7 July 1904 (MCZ; Allen 1905, Peters 1927).

Bimini - Cory (1891b) noted specs. (not located by myself or by Hellmayr 1935). Paulson (1966) searched for birds in mangroves without success. Sighting, 19 Sept. 1987 (Norton 1988a).

Berry Islands - Cory (1891b) noted specs. (not located by myself or by Hellmayr 1935).

Andros - 21 specs.: 3 from 9 April-12 May 1884 (2 BMNH, 1 MCZ), 1 on 25 Nov. 1887 (FM), 7 from 15 Jan.-11 May 1902 (2 AMNH, 2 BMNH, 2 Cornell University, 1 MCZ; Bonhote 1903 found these and commented that "they seem solely to inhabit the mangroves, especially the large clumps standing out in the lagoons"), 2 from 13 May 1904 (AMNH), 1 on 15 April 1909 (CM; Todd and Worthington 1911), 3 from 24 April-26 May 1915 (MCZ; probably those examined by Peters 1927), 1 on 27 May 1921 (USNM), and 3 from 3-23 June 1970 (LSU). Northrop (1891) noted an additional spec. taken 24 June 1890 (not located). Listed by Cory (1892a).

New Providence - 4 specs.: 8 March 1886 (USNM; noted from 19 March by Ridgway 1891), 14 Feb. 1922 (AMNH), 24 Jan. 1949 (University of Michigan Museum of Zoology [UMMZ]; Van Tyne and Mayfield 1952 collected this ind.; as it was the only bird they saw, they concluded that this warbler is rare here; also in Bond 1957), and 27 June 1970 (LSU). Bangs (1900) noted a 7 May 1897 spec., and Schwartz and Klinikowski (1963) reported an ind. taken 27 Nov. 1960 (neither located). Bryant (1866) examined 2 specs. (not located) that he thought, with some equivocation, were migrants from the mainland. Brudenell-Bruce (1975) considered it a fairly common resident "in spite of reports to the contrary." Listed by Cory (1892a) and Riley (1905a).

Eleuthera - 3 specs.: 1 on 12 March 1886 (USNM; Ridgway 1891) and 2 from 17-25 Nov. 1891 (FM; Hellmayr 1935). Listed by Cory (1892a) and Riley (1905a). Connor and Loftin (1985) were aware of the old specs. and felt that although the bird once bred on Eleuthera, it did not do so any longer as Connor had not found one in 5 years of field work; "extensive cutting and farming may have extirpated the taxon on the island." They also reported a migrant Yellow Warbler from 17 Aug.-4 Nov. Norton (1986b) noted a migrant observed on 12 March.

Cat Island - 1 spec., 8 March 1886 (USNM). Buden (1987c) concluded that they are uncommon and presumably resident in the mangrove swamps and immediately adjacent scrub on this island. He found 2 nests ca 1 m high in the tops of small black mangroves; 1 contained 3 eggs (6 June) and the other was empty (16 June). He also saw "2 or 3 recently fledged young soliciting food from an adult" on 20 June.

Conception Island - 8 specs.: 6 from 8 March 1886 (USNM; Ridgway 1891 noted 8 from this period) and 2 from 13 Feb. 1934 (MCZ). Listed by Cory (1892a) and Riley (1905a).

San Salvador - 56 specs.: 7 from 4-11 March 1886 (USNM; Ridgway 1891), 21 from 5-22 Oct. 1891 (19 FM, 2 BMNH; Cory 1892, Hellmayr 1935), 1 on 12 July 1903 (USNM; probably noted by Riley 1905b), 2 from 17-18 March 1909 (CM; Todd and Worthington 1911), 15 from 16-22 Aug. 1923 (USNM), 3 from 18 Feb. 1933 (MCZ), 4 from 26-27 Dec. 1963 (LSU), 1 on 23 June

1966 (LSU), and 2 from 13-20 Feb. 1981 (USNM). Miller (1978) considered it abundant in thickets, scrub, and coppice as well as in mangrove edge; he found a nest with 1 egg on 15 May and observed a fledgling being fed on 17 April 1975. Listed by Cory (1892a) and Riley (1905a).

Exuma Cays - 2 specs., 24 Dec. 1967 (LSU). Listed by Cory (1892a) and Riley (1905a).

Long Island - Noted as "not uncommon" during May and June (Cory 1890). Listed by Cory (1892a) and Riley (1905a).

Rum Cay - 20 specs.: 16 from 1-6 March 1886 (14 USNM, 1 AMNH, 1 Florida State Museum [UF]; Ridgway 1891 noted 34 specs. from this period), 3 from 10 July 1903 (USNM; probably among those that Riley 1905b considered common in mangroves), and 1 on 16 June 1966 (LSU). An FM spec. was noted by Hellmayr (1935, not located). Listed by Cory (1892a) and Riley (1905a).

Samana Cay - Listed by Buden (1987a).

Ragged Islands - Breeding confirmed on Nurse Cay (Buden 1987b).

Fortune Island - 1 spec., 13 July 1930 (USNM). Listed by Buden (1987a).

Bird Rock - 1 spec., 21 May 1879 (FM; Hellmayr 1935). Listed by Buden (1987a).

Crooked Island - Listed by Buden (1987a).

Fish Cay - Listed by Buden (1987a).

Guana Cay - Listed by Buden (1987a).

Acklins Island - 4 specs., 6 July 1930 (USNM). Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Castle Island - 1 spec., 8 July 1930 (USNM). Listed by Buden (1987a).

South Cay - 3 specs., 1 Aug. 1930 (USNM).

Plana Cays - 9 specs., 16-19 July 1930 (USNM). It is not indicated from which of the Planas the specs. came; Buden (1987a) listed both West and East. Several inds. were seen in Oct. 1967 and another in March 1968 on East Plana (Clough and Fulk 1971).

Mayaguana - 44 specs.: 34 from 11 Aug.-19 Sept. 1891 (FM; Cory 1892b, Hellmayr 1935), 6 from 18-20 July 1930 (USNM), 1 each on 24 Feb. 1933 (MCZ) and 13 March 1972 (LSU), and 2 from 1-5 Oct. 1976 (LSU). Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Booby Cay - 4 specs., all 21 July 1930 (USNM). Listed by Buden (1987a).

Great Inagua - 142 specs.: at least 4 from 26 May-3 June 1879 (FM) and 3 from 1 Jan.-1 Feb. 1888 (2 FM, 1 UMMZ); 116 are apparently from 26 Feb.-23 Oct. 1891 (7 BMNH, 109 FM; Cory 1891e, 1892b, Hellmayr 1935; the year is not clear on some of the FM specs. and they may actually be part of the previous two series), 10 from 5-27 Feb. 1909 (9 CM, 1 MCZ; Todd and Worthington 1911), 3 from 7-9 Aug. 1930 (USNM), and 6 from 29 Nov.-6 Dec. 1960 (LSU). "Quite abundant both among the mangroves and in the clumps of trees in the savanna" (Bryant 1866). Noted as "not uncommon"

during May and June (Cory 1890). Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Little Inagua - 5 specs.: 4 from 5-6 Aug. 1930 (USNM) and 1 on 14 March 1976 (CM). Observed by Bond and Meyer de Schauensee (1944). Listed by Buden (1987a).

West Caicos - 7 specs., 4 Aug. 1930 (USNM). Bond and Meyer de Schauensee (1944) noted 5 additional specs. collected in March 1941 (not located). Listed by Buden (1987a).

Providenciales - 2 specs. reported, March 1941 (Bond and Meyer de Schauensee (1944, not located). Listed by Buden (1987a).

Bay Cay - Listed by Buden (1987a).

Water Cay - Listed by Buden (1987a).

Pine Cay - Reported nesting (Buden 1987a).

Ft. George Cay - 2 specs., 24 July 1930 (USNM). Listed by Buden (1987a).

Stubbs Cay - 2 specs., 25 July 1930 (USNM). Listed by Buden (1987a).

Parrot Cay - Listed by Buden (1987a).

North Caicos - Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Middle Caicos - 12 specs.: 3 from 8 Jan.-6 Feb. 1891 (FM; Cory 1891b, Hellmayr 1935), 5 from 26-29 July 1930 (USNM), and 1 on 7 June 1971 and 3 from 5-15 March 1976 (all LSU). Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

East Caicos - Listed by Cory (1892a), Riley (1905a).

South Caicos - 12 specs., all 17-21 Jan. 1961 (10 LSU, 1 Los Angeles County Museum of Natural History [LACM], 1 Delaware Museum of Natural History [DNHM]). Listed by Buden (1987a).

Little Ambergris Cay - Listed by Buden (1987a).

Grand Turk - 22 specs.: 2 on 31 July 1930 (USNM), 5 from 25-27 Jan. 1961 (LSU), 4 from 28 May-1 June 1971 (LSU), and 11 from 10 March-1 April 1972 (LSU). Bond (1959) noted a Jan. 1959 sighting. Reported in the 1985 CBC. Listed by Buden (1987a).

Long Cay - Listed by Buden (1987a).

Cotton Cay - Listed by Buden (1987a).

Penniston Cay - Listed by Buden (1987a).

Salt Cay - A nest with 3 eggs was found 1 m above ground in sparse, coastal scrub, 1 or 2 km from the nearest mangroves, on 13 June 1979. One egg hatched 21 June, another the next day (Buden 1987a).

Dendroica pensylvanica - Chestnut-sided Warbler. The only reports are from 20 Sept.-early Nov. and in May.

Grand Bahama - 3 inds. have been banded (Bond 1980). Sighting of 2 inds., early Oct. 1987 (Norton 1988a).

Andros - Sighting, early Nov. 1968 (Bond 1969).

New Providence - Bryant (1859) wrote that there were "only a few seen in the early part of May" (repeated by Albrecht 1861). Cooke (1904) felt that Bryant's birds "were

undoubtedly spring migrants that had wandered far out of their usual course." Brudenell-Bruce (1975) considered it a rare passage migrant from 15 Sept. to 25 Oct., but not occurring recently in the spring. Listed by Cory (1890, 1892a), Riley (1905a), and Bond (1950).

Eleuthera - Sighting, of an immature bird, 20 Sept. 1978 (Connor and Loftin 1985).

Mayaguana - 1 spec., 1 Oct. 1976 (LSU; Buden 1987a). Sightings: 14 May 1972; several inds., 1-12 Oct. 1976 (all in Buden 1987a).

Providenciales - Sighting, 14 May 1987 (Norton 1987b).

Dendroica magnolia - Magnolia Warbler. This "is apparently a regular winterer in the Bahamas" (Paulson 1966). There are reports from every month between 30 Sept. and 30 April.

Grand Bahama - 1 tower-kill, 22 Oct. 1966 (Kale et al. 1969); 1 netted, 25 Feb. (Bond 1972). Sightings: Nov. 1959 (Bond 1960), 15 Jan. and 21 and 25 April, all 1969 (Emlen 1977).

Andros - Sighting, of 2 birds, 23-25 Nov. 1964 (Bond 1965). Reported in 2/5 CBC's.

New Providence - Bryant (1859) considered this species "as abundant as in the United States," with a few seen as early as 15 March 1859. Albrecht (1861), Cory (1890, 1892a), Ridgway (1902), and Riley (1905a) listed the bird on this basis, but Cooke (1904) wrote that Bryant's claims "are certainly questionable." Sighting, 31 Jan. 1964 (Bond

1964). Brudenell-Bruce (1975) noted extreme dates of 20 Sept. and 20 May but that it was most common in passage in Oct.

Eleuthera - 1 spec., 16 Nov. 1891 (FM; Cory 1892a; Cooke 1904, unaware of the spec., questioned Cory's claim because "no authority is cited in support of the statement"; subsequently listed by Ridgway 1902, Riley 1905a, and Hellmayr 1935). Connor and Loftin (1985) considered it an uncommon winter resident from 1 Oct.-9 April that can be "found throughout the island." Reported in 3/5 CBC's.

Cat Island - 1 spec., 29 Nov. 1963 (LSU; Paulson 1966 collected this and saw 2 others; Buden 1987c specified that Paulson's sightings occurred from 27 Nov.-2 Dec. 1963).

San Salvador - 5 specs. located, 6-21 Oct. 1891 (FM; Cory 1892b claimed 6 spec., Hellmayr 1935 noted 5). Listed thereafter by Cory (1892a), Ridgway (1902), and Riley (1905a). Paulson (1966) saw at least 5 and collected 1 or more specs. (not located).

Great Exuma - Sighting, Jan. 1964 (Bond 1964).

East Plana Cay - Sighted twice feeding in low shrubs, Oct. 1967 (Clough and Fulk 1971; also in Buden 1987a).

Mayaguana - 1 spec., 30 Sept. 1976 (LSU; listed by Buden 1987a).

Great Inagua - 1 spec., 7 Dec. 1960 (LSU; listed by Buden 1987a).

Providenciales - 3 inds. banded: 17 Jan. 1983 (recaptured 21 March 1983), 9 Dec. 1983 (recaptured 29 April

1984), and 29 Dec. 1983 (recaptured 27 March 1984) (all in Buden 1987a).

North Caicos - 1 spec., 16 Feb. 1972 (LSU; listed by Buden 1987a).

East Caicos - Listed by Buden (1987a)

Grand Turk - Sighting, 30 April (Buden 1987a).
Reported in the 1985 CBC.

Dendroica tigrina - Cape May Warbler. There are spec. records from 22 Sept. to 3 May and from every month in between. The bulk of the records, especially in the northern islands, comes from Oct.-Nov. and March-April. A greater proportion of southern islands records is from mid-winter.

Grand Bahama - 4 specs.: 2 from 30 Dec. 1891 (FM; Hellmayr 1935), and 1 each on 22 Feb. 1942 and 27 April 1946 (both CM). 11 tower-kills, 22 Oct. 1966 (Kale et al. 1969). On 25 Jan. 1971, one was observed feeding at and defending a large Agave braceana inflorescence; on 28 Jan., one attempted to feed on plants defended by a Palm Warbler (Emlen 1973). This species has been noted as a winter resident (density = $6.75/\text{km}^2$) in submature pines and coppets and an abundant transient in early May 1968 and late April 1969 (Emlen 1977).

Great Abaco - 4 specs.: 2 from 6 and 7 April 1886 (USNM; Ridgway 1891 noted 4 specs. from 26 March-7 April [others not located]), and 1 each from 8 April 1946 (CM) and

18 April 1965 (LSU;). Todd and Worthington (1911) noted it as late as the first week in May. Listed by Cory (1892a) and Riley (1905a). Conklin (1970) found a post-Colombian fossil in a cave. Reported in the 1974 CBC.

Little Abaco - 1 spec. reported, 22 March 1902 (Bonhote 1903a, not located). Listed by Riley (1905a).

Bimini - Spec.(s) reported, Jan. or Feb. 1891 (Cory 1891b, not located). Listed by Cory (1892a), Riley (1905a), and Vaurie (1953). Mayr (1953) considered it the third-most common warbler and noted that it fed in higher trees. He commented that very few females were seen (however, about 45% of the specs. that I have located from the Bahamas are females, suggesting that, in general at least, the sex ratio for the region is not overly skewed).

Berry Islands - 2 specs., 1 and 5 April 1891 (FM; Cory 1891b, Hellmayr 1935); listed by Cory (1892a) and Riley (1905a).

Andros - 3 specs. located: 24 April 1897 (MCZ) and 2 from 12 and 17 April 1909 (CM; Todd and Worthington 1911). Northrop (1891) reported 3 additional specs. from 22 March and 20 April 1890 (not located) (the latter was noted as a late spring date by Cooke 1904). Listed by Cory (1892a) and Riley (1905a). Walkinshaw and Walkinshaw (1961) observed 7 inds. and netted 1 on 23 March 1960. Reported in 5/5 CBC's.

New Providence - 26 specs. located: 1 each on 21 Jan. (BMNH) and 23 Jan. 1879 (FM; Hellmayr 1935 noted the existence of the latter spec.), 3 from 27 Feb.-24 March 1884

(MCZ), 5 from 19 March-16 April 1886 (USNM; Ridgway 1891 noted 7 specs. from this time period), 1 each on 1 April and 3 May 1897 (MCZ; Bangs 1900 probably was referring to one or the other of these), 21 and 28 April and 26 Nov. 1898 (first in BMNH, others in AMNH; Bonhote 1899), 17 April 1902 (BMNH; Bonhote 1903), 6 from 29 Dec. 1908-16 Jan. 1909 (CM; Todd and Worthington 1911), 1 on 11 March 1921 (BMNH), 30 Jan. 1922 (AMNH), and 2 from 18 Feb. 1949 (UMMZ). Bryant (1859; also noted by Albrecht 1861) shot a female on 6 May 1859 and Baird (1865) reported a 14 May 1864 spec. (neither located). Cory (1891a) noted that birds were first observed 19 March 1891 and were common after 23 March (also in Cooke 1904 as a spring arrival date). Although there may be an influx during migration, spec. dates indicate that at least some inds. overwinter. Brudenell-Bruce (1975) indicated that they were more common as migrants, particularly in April, than during the winter (extreme dates - 30 Aug. and 13 May). Bond (1959) noted a 10 Sept. sighting and Bent (1953) quoted 15 May as a late date. Listed by Cory (1890, 1892a) and Riley (1905a).

Eleuthera - 26 specs.: 14 from 13 Nov.-1 Dec. 1891 (12 in FM, 2 in BMNH; Hellmayr 1935 noted 11 FM specs.), 6 from 20-27 April 1897 (MCZ; Bangs 1900 indicated that some, or perhaps all, of 9 specs. he received came from adjacent Current Island), and 6 from 21 Oct.-6 Nov. 1961 (LSU). Listed by Cory (1892a) and from both Eleuthera and Current Island by Riley (1905a). Connor and Loftin (1985)

considered it a common winter resident throughout the island from 28 Aug.-2 May. Reported in 5/5 CBC's.

Cat Island - 1 spec., 19 Nov. 1890 (Academy of Natural Science of Philadelphia [ANSP]).

San Salvador - 7 specs.: 4 from 12-19 Oct. 1891 and 1 ind. 22 Oct. 1892 (all FM; Cory 1892b noted 7 specs. from 28 Sept.-9 Nov.; Hellmayr 1935 located 4 FM specs.), and 2 from 24 and 26 March 1909 (CM; Todd and Worthington 1911). Listed by Cory (1892a) and Riley (1905a).

Cay Sal - 1 spec., 19 April 1968 (LSU; Buden and Schwartz 1968 collected this and considered this "among the most common of migrants observed"; they saw particularly large numbers on 19-20 April). Listed by Buden (1987b).

Green Cay - 1 spec., 12 April 1886 (USNM; Ridgway 1891 noted 3 specs. from this date). Listed by Cory (1892a) and Riley (1905a).

Rum Cay - 4 specs., all from 1-6 March 1886 (USNM; Ridgway 1891 noted 5 specs. from this time period). Listed by Cory (1892a) and Riley (1905a).

Cay Lobos - Birds struck the lighthouse on 2 May 1900 (Bonhote 1901) and on 20 Oct. and 22 Nov. 1900 and 14 Feb. and 15 and 21 April 1901 (Bonhote 1903b). Noted by Riley (1905a) and Bent (1953, with 20 Oct. listed as an early date).

Crooked Island - Sighting, 1 May 1972 (Buden 1987a).

Acklins Island - Noted by Todd and Worthington (1911) and listed by Buden (1987a).

West Plana Cay - Listed by Buden (1987a).

Mayaguana - Listed by Buden (1987a).

Great Inagua - 39 specs.: 3 from 31 Jan.-8 Feb. 1888 (FM), 23 from 26 Feb.-25 April 1891 (21 in FM, 2 in BMNH), 3 from 22-23 Sept. 1891 (FM; Cory 1891b noted the middle series and Hellmayr 1935 counted 27 FM specs.), 4 from 4-25 Feb. 1909 (CM; Todd and Worthington 1911), and 6 from 29 Nov.-12 Dec. 1960 (LSU). Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Little Inagua - Listed by Buden (1987a).

West Caicos - Listed by Buden (1987a).

Providenciales - Inds. banded 18 Dec. 1981 (recaptured 6 Feb. 1982) and 29 Dec. 1983 (recaptured 7 April 1984) (Buden 1987a).

Parrot Cay - Listed by Buden (1987a).

North Caicos - Listed by Buden (1987a).

Middle Caicos - 2 specs., 15 Jan. 1891 (FM; Hellmayr 1935) and 19 Jan. 1972 (LSU). Listed by Buden (1987a).

East Caicos - Listed by Buden (1987a).

South Caicos - 4 specs., 11-20 Jan. 1961 (LSU; listed by Buden 1987a on the basis of these).

Grand Turk - 3 specs., 25-28 Jan. 1961 (LSU).

Considered "abundant" in Sept. and Oct. (Buden 1987a). The most common migrant warbler in the 1985 CBC.

Dendroica caerulescens - Black-throated Blue Warbler. There are a few fall records, including a sighting 15 Sept. and a

spec. reported (not located) 25 Nov. The great majority of records are from spring, most from April through 9 May. Mid-winter specs. and reports exist, but have not been frequent. Most reports either do not specify subspecies or are of D. c. caerulescens; the few of D. c. cairnsi are so denoted.

Grand Bahama - 2 specs.: 28 April 1946 (CM) and 2 Feb. 1968 (LSU). Seven tower-kills, 22 Oct. 1966 (Kale et al. 1969). Emlen (1977) considered this a winter resident in coppets at a density of 1.58/km².

Bimini - Sighting, 4 May 1947 (Vaurie 1953). A male came aboard a vessel near Great Isaac, to the east of the Biminis proper, on 8 May (Cory 1890).

Andros - 2 specs., 28 April and 7 May 1896 (BMNH). Northrop (1891) had received 1 spec. on 11 April and collected others on 19 April 1890 (none located); he indicated that the species was quite common for a few days, but was not seen after 19 April. Listed by Cory (1892), Riley (1905a), and Todd and Worthington (1911, as a not uncommon winter resident). Schwartz and Klinikowski (1963) observed both D. c. caerulescens and D. c. cairnsi in Nov. 1960. Reported in 4/5 CBC's.

New Providence - 5 specs. located: 16 April 1886 (USNM; probably 1 of the 2 specs. noted by Ridgway 1891 from 10 April), 28 April 1898 (AMNH) and 9 May 1898 (BMNH; Bonhote 1899 collected 2 specs. on 28 April and 1 each of 9 May and 25 Nov. 1898 [additional pair not located]; he also

indicated the species "occurs regularly on both migrations"), 18 April 1902 (BMNH; Bonhote 1903a), and 18 Jan. 1909 (CM; Todd and Worthington 1911, who also considered this a not uncommon winter resident). Bryant (1859) wrote that the species was "very abundant near Nassau, from the 20th of April to the 13th of May [1859]" (also in Albrecht 1861). Brudenell-Bruce (1975) noted extreme dates of 17 Sept. and 14 May.

Eleuthera - 1 spec., 22 Oct. 1961 (LSU; Schwartz and Klinikowski 1963). Connor and Loftin (1985) considered it a common winter resident from 18 Sept.-25 April. Reported in 5/5 CBC's.

Cat Island - 1 spec., 8 March 1886 (USNM; Ridgway 1891; subsequently listed by Cory 1892a and Riley 1905a).

San Salvador - 1 spec. reported, 4 March 1886 (Ridgway 1891, not located). Listed by Cory (1892a) and Riley (1905a). Todd and Worthington (1911) considered it a not uncommon winter resident.

Cay Sal - 1 spec. located, 20 April 1968 (LSU; Buden and Schwartz 1968 indicated that they had collected 2 spec. on that date, one D. c. caeruleus and one D. c. cairnsi, and that they also saw several other inds. in sparse scrub near the upper beach zone). Also in Bond (1970) and Buden (1987b).

Anguilla - 1 spec. located, 9 May 1891 (FM; Cory 1891f; Hellmayr 1935 noted 2 specs.). Listed by Cory (1892a), Riley (1905a) and Buden and Schwartz (1968).

Crooked Island - Listed by Buden (1987a).

Acklins Island - Listed by Buden (1987a).

East Plana Cay - 2 sightings, Oct. 1967 (Clough and Fulk 1971); listed by Buden (1987a).

Mayaguana - 1 spec., 2 Oct. 1976 (LSU). Sighting, 7 May 1972 (Buden 1987a).

Cay Lobos - 6 birds struck the lighthouse from 26 April-3 May 1900 (Bonhote 1901) and 10 more from 20-28 Oct. 1900 and 23 March-14 May 1901 (Bonhote 1903b).

Great Inagua - 6 specs. located: 5 from 21 April-1 May 1891 (FM; listed by Cory 1892a and Riley 1905a on this basis; Hellmayr noted 6 specs. in the FM; he perhaps included a 9 May 1891 spec. collected "at sea") and 1 from 7 Dec. 1960 (LSU; Schwartz and Klinikowski 1963 and Buden 1987a identified this as D. g. cairnsi).

Little Inagua - Listed by Buden (1987a).

Providenciales - 1 ind. banded 28 Nov. 1980 and recaptured 14 Jan. 1981 (Buden 1987a).

Middle Caicos - Listed by Buden (1987a).

Grand Turk - Sighting, 15 Sept. 1976 (Buden 1987a).

Dendroica coronata - Yellow-rumped Warbler. There are specs. from as early as 13 Oct. and as late as 28 April; the vast majority of reports and specs., however, come from Jan.-March.

Grand Bahama - 1 spec., 30 Dec. 1891 (FM); listed by Cory (1892a) and Riley (1905a). Emlen (1977) considered it

the fourth most common winter resident at a density of 66.5/km² in marsh, coppets, and submature pines.

Walker Cay - 1 spec., 7 April 1946 (CM)

Great Abaco - 5 specs.: 1 on 2 March 1886 (USNM; Ridgway 1891 noted this and another spec. taken 2 April 1886 [not located]) and 4 from 17-23 March 1891 (FM; Cory 1891b, Hellmayr 1935). Listed by Cory (1892a) and Riley (1905a). Reported in the 1974 CBC.

Little Abaco - 3 specs., 22-24 March 1902 (2 in AMNH, 1 in BMNH; Bonhote 1903). Listed by Riley (1905a).

Bimini - 4 specs., 26 March 1891 (FM; Cory 1891b, Hellmayr 1935). Sighting, 29 Nov. 1949 (Vaurie 1953); listed by Cory (1892a) and Riley (1905a).

Berry Islands - 1 spec. reported, March 1891 (Cory 1891b, Hellmayr 1935; not located). Listed by Cory (1892a) and Riley (1905a).

Andros - 6 specs.: 4 from 4-18 Dec. 1887 (FM; Hellmayr 1935 reported only 1 FM spec.), and 1 each on 26 March 1896 (BMNH) and 10 Feb. 1902 (BMNH, from nearby Mangrove Cay; Bonhote 1903a noted a 10 Jan. 1902 spec., perhaps referring to the BMNH spec.). Noted by Todd and Worthington (1911); listed by Riley (1905a). Walkinshaw and Walkinshaw (1961) netted 4 and saw 2 others feeding on fruits on 24-25 March 1960. Reported in 3/5 CBC's.

New Providence - 5 specs. located: 1 each on 1 Jan. 1879 (FM; Hellmayr 1935), 21 March 1887 (USNM), 28 April 1898 (BMNH), and 27 Jan. and 14 March 1922 (both BMNH).

Cory (1891a) indicated that spec.(s) had been taken between 14 March-2 April 1891 (not located; Bent 1953 cited 2 April as a late date). Bonhote (1903a) collected a spec., 22 Feb. 1902 (not located). A few were observed in Jan. and Feb. 1859, but they had disappeared by mid-March (Bryant 1859, Albrecht 1861). Todd and Worthington (1911) considered it common and indicated that the bulk leaves by the end of March. Cory (1890) considered the species common in Dec. and Jan. Brudenell-Bruce (1975) noted extreme dates of 18 Sept. and 29 April as well as an unusual report on 5 June. He indicated, however, that they are seldom numerous before Dec. and generally remain scarce until Feb. after which they are common until late April. Listed by Cory (1892a) and Riley (1905a).

Eleuthera - 2 specs., 24 and 26 Nov. 1891 (FM; listed by Cory 1892a, Riley 1905a, and Hellmayr 1935). Connor and Loftin (1985) considered this the second most abundant warbler throughout the island from 17 Oct.-2 April. Sighting, 17 Oct. (Bond 1986). Reported in 2/5 CBC's.

San Salvador - 1 spec., 13 March 1909 (CM; Todd and Worthington 1911).

Cay Sal - 1 ind. struck the lighthouse on 13 March 1901 and 8 others on 15 Dec. 1901 (Bonhote 1903b). Noted by Riley (1905a), Buden and Schwartz (1968; these authors failed to observe the species in their search, however), and Buden (1987b).

Rum Cay - 2 specs., 3 and 5 March 1886 (USNM; Ridgway 1891); listed by Cory (1892a) and Riley (1905a).

Acklins Island - Noted by Todd and Worthington (1911); listed by Buden (1987a).

East Plana Cay - Birds were seen daily in groups of up to 5 inds. foraging on beach terrace and in low shrubs in Oct. 1967 (Clough and Fulk 1971; noted by Buden 1987a).

Mayaguana - 1 spec., 13 Oct. 1976 (LSU). Sighting, 3 Oct. 1976 (Buden 1987a)).

Cay Lobos - Birds struck the lighthouse on 1 March and 24 Nov. 1900 (Bonhote 1901) and on 22 Nov. 1900, 14 Feb. and 21 and 25 March 1901 (Bonhote 1903b). Bent (1953) noted 22 Nov. as an early fall date. Listed by Riley (1905a).

Great Inagua - 5 specs.: 1 from 16 Feb. 1881 (FM) and 4 from 27 Feb.-2 March 1891 (1 BMNH, 3 FM; Cory 1891b noted the latter series and Hellmayr reported 5 FM specs.). Noted by Todd and Worthington (1911); listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Little Inagua - Listed by Buden (1987a).

West Caicos - 2 specs., 1 and 15 Jan. 1891 (BMNH; see discussion under Middle Caicos).

Providenciales - 1 ind. banded 24 Nov. 1980 and recaptured 1 March 1981 (Buden 1987a). Sightings: 12 April 1975 (Buden 1987a), and a bird identified as D. c. auduboni on 23 and 30 March (Norton 1985; all other reports are presumably of the nominate subspecies).

Ft. George Cay - Listed by Buden (1987a).

Parrot Cay - Listed by Buden (1987a).

North Caicos - See Middle Caicos discussion.

Middle Caicos - 17 specs.: 5 from 10-28 Jan. 1881 and 12 from 9 Jan.-6 Feb. 1891 (all FM; Cory 1891b noted the latter series; also in Hellmayr 1935). Some (many?) of these specs. may be from West Caicos (as are the BMNH specs. from this time period), or North or East Caicos (both listed, along with Middle Caicos, by Cory 1892a, Riley 1905a, and Buden 1987a).

East Caicos - See Middle Caicos discussion.

Grand Turk - Listed by Buden (1987a). Reported in the 1985 CBC.

Cotton Cay - Listed by Buden (1987a).

Big Sand Cay - Listed by Buden (1987a).

Dendroica townsendi - Townsend's Warbler.

Grand Bahama - Sighting, 28 April 1984 (Norton 1984b reported that this was expertly documented).

Grand Turk - Sighting, 19 Jan. 1986 (G. H. Rosenberg took two photographs that, in combination, substantiate this identification).

Dendroica virens - Black-throated Green Warbler. There is at least one report from every month, except March, from Oct. to June.

Grand Bahama - Sightings: Nov. 1959 (Bond 1960) and 30 Dec. 1987 (Norton 1988b); 1 ind. netted, 25 Feb. (Bond 1972). Emlen (1977) reported a winter density of 0.67/km².

Abaco - Sighting, 21 Feb. (Bond 1977).

Andros - Sightings, early Nov. and 16 Nov. (Bond 1969). Reported in 3/5 CBC's.

New Providence - Sighting, 31 Jan. 1964 (Bond 1964). Noted as uncommon from 21 Sept. to 23 April (Brudenell-Bruce 1975).

Eleuthera - 1 spec., 11 Feb. 1949 (UMMZ; Van Tyne and Mayfield 1952). Sighting, 6 May 1956 (Bond 1957). Connor and Loftin (1985) considered it "a scarce transient and winter resident from 5 Oct. to 9 April." Reported in 1/5 CBC's.

San Salvador - 1 spec., 12 Oct. 1891 (FM; Cory 1892b, then listed by Cory 1892a, Riley 1905a, Hellmayr 1935, and Bond 1950).

Crooked Island - Sighting, 11 April 1972 (Buden 1987a).

Mayaguana - 1 spec., 6 Oct. 1976 (LSU; Buden 1987a collected this and saw others on 8 and 12 Oct. 1976).

Great Inagua - 1 spec. reported, 4 Dec. 1960 (Schwartz and Klinikowski 1963, not located). Buden (1987a) noted this as well as a 28 Nov. 1973 sighting.

North Caicos - 1 spec., 8 June 1971 (LSU; Buden 1987a noted this and 3-12 Feb. 1978 sightings).

Dendroica fusca - Blackburnian Warbler. Most records are from Oct.; there is a sight report on 24 Dec. and then a number of spring reports in April through 3 May.

Grand Bahama - 1 netted, 20 Oct. (Bond 1972), and a total of 5 banded (Bond 1980). Sighting[s?]: Nov. 1959 (Bond 1960) and 14 Nov. (Brudenell-Bruce 1975).

Great Abaco - Sighting, 29 Dec. 1983 (Norton 1984a); as this is one of the very few mid-winter West Indian reports of this species it must be considered in need of verification.

Andros - Sightings: 1 Oct. 1967 (Bond 1968) and 23 April (Bond 1969).

New Providence - Sighting, of a pair, 30 April 1859 (Bryant 1859; cited by Albrecht 1861, Cory 1890, 1892a, Riley 1905a, and Bond 1950). Noted as a rare autumn passage migrant from 19 Aug. to 30 Sept. (Brudenell-Bruce 1975).

Eleuthera - Sighting, 22 Oct. 1977 (Connor and Loftin 1985).

San Salvador - 2 specs., 12 Oct. 1891 (FM; Cory 1892; noted thereafter by Cory 1892a, Riley 1905a, Hellmayr 1935, and Bond 1950).

Mayaguana - Sightings, 6 and 12 October 1976 (Buden 1987a).

Providenciales - Sightings: 25 April (Norton 1985, Buden 1987a) and 3 May (Norton 1982b).

Dendroica dominica - Yellow-throated Warbler. One subspecies, D. d. flavescens, is a permanent breeding resident of Grand Bahama and Great Abaco. Specs. of migrants have been taken from 2 Aug. through 15 April, without a big peak in any particular month. Bond (1942) felt that this was one of the first migrants to arrive in fall and the earliest to leave in spring. Most reports of migrants refer to D. d. dominica; exceptions are noted below. Differences in foraging behavior between resident and mainland birds have been noted by Bond (1968), who reported that birds of the indigenous race would often alight on the lower section of a pine trunk and then work upward like a Brown Creeper, and that he had never noticed this behavior among wintering migrants in similar habitats. Bond (1972) suggested that migrants are common on islands lacking residents and seem to be rare where flavescens resides.

Grand Bahama - I have located 18 specs. identified as the resident subspecies: 4 from 8-17 May 1936 (3 MCZ, 1 AMNH), 4 from 27-28 April 1946 (3 CM, 1 USNM), 3 from 2-3 Feb. 1968 (LSU), 1 on 8 Sept. 1970 (Southwestern College, Kansas [SWK]), and 6 from 17-18 Aug. 1978 (USNM). 4 specs. from 21 Dec. 1891-23 Jan. 1892 have been identified as D. d. dominica (FM; Hellmayr 1935), and the identity of 2 from 22 Feb. 1942 (CM) is unclear. In his description of the resident bird of Abaco, Todd (1909) noted that it may be expected to occur on Grand Bahama as well. Bond (1930) also

noted that flavescens is "probably also present on Grand Bahama." Hellmayr (1935) still listed only Abaco in the range of the subspecies. Bond (1950) noted that residents were less common in pine forests here than on Abaco. Emlen (1977) estimated that there were 14 resident birds/km² and only 7 migrants/km² (in pines; he conceded, however, that identification to subspecies was often impossible in the field) (this difference in density was repeated by Bond 1978). The presence of migrants was noted by Cory (1892a) and Riley (1905a).

Great Abaco - There are 9 specs. that are identified as flavescens: 1 on 13 June 1891 (FM; Cory 1891d), 4 from 24 April-7 May 1909 (2 CM, 1 MCZ, 1 FM; Todd and Worthington 1911 collected these in pine habitat), 2 from 11 April 1936 (MCZ), and 1 each on 11 April 1965 (LSU) and 26 July 1971 (ROM). The subspecific identifications of 1 spec. from 18 March 1892 (FM) and 3 from 7-17 April 1946 (CM) are unclear. Todd (1909) described the residents as a species (D. flavescens) on the basis of the 1891 and 1909 specs. listed above. Riley (1905b) had collected 2 specs. on 22 July 1904 (not located) and surmised that these were resident birds. Bond (1930) reduced the status of flavescens to that of a subspecies of D. dominica. Karr and Roth (1971) estimated that there were 50 pairs of residents/40 hectares. King et al. (1979) observed adults carrying food on 21 May 1977 and took this as evidence that the birds were nesting. Listed

by Cory (1892a) and Riley (1905a). Reported in the 1974 CBC.

Bimini - 4 specs., 23-29 March 1891 (FM; Cory 1891, Hellmayr 1935). Vaurie (1953) reported observations as early as 16 Aug. 1951. Listed by Cory (1892a) and Riley (1905a).

Berry Islands - Spec.(s) reported, undated (Cory 1891b, not located). Listed by Cory (1892a) and Riley (1905a).

Andros - 4 specs.: 1 each on 13 Jan. 1879 (FM; Hellmayr 1935 noted 2 FM specs.), 21 Jan 1902 (BMNH; Bonhote 1903a), 2 Aug. 1904 (MCZ; Allen 1905), and 17 Nov. 1960 (LSU). 2 netted, 22 March and another observed 18 March 1960 (Walkinshaw and Walkinshaw 1961). Listed by Riley (1905a). Reported in 5/5 CBC's.

New Providence - 17 specs.: 4 from 31 Dec. 1878-23 Jan. 1879 (FM; Hellmayr 1935), 1 on 5 Feb. 1884 (MCZ), 1 on 15 April 1886 (USNM; Ridgway 1891; Bent 1953 noted this as a late date), 3 from 23-27 Aug. 1898 (2 BMNH, 1 AMNH; Bonhote 1899), 1 ind. 19 Oct. 1898 (AMNH; Bonhote 1899), 1 each on 19 Feb. (BMNH) and 3 March 1902 (AMNH; Bonhote 1903a collected these as well as 2 spec. on 12 Dec. 1901), 2 from 2 and 6 Jan. 1909 (CM; Todd and Worthington 1911), and 1 each from 17 Jan. 1922 (AMNH), 27 Dec. 1926 (FM), and 17 Jan. 1949 (UMMZ). Brace (1877) shot a spec. 30 Sept. 1876 (not located) and observed another ind. 22 Oct. 1876. 1 or 2 were killed (if preserved, not located) and others seen in Nov., Dec., and Jan. (Moore 1877). Sighting, 7 Aug. 1904

(Allen 1905). Bonhote (1899) noted that they arrive in August and are abundant throughout winter in pine barrens. Cory (1890) considered them quite abundant in pine barrens and noted that food items were principally small insects and larvae. Brudenell-Bruce (1975) listed extreme dates of 15 July and 22 April and commented that it becomes common in Aug. but generally leaves by mid-March. Bond (1942) and Bent (1953) noted an early date of 26 July; listed by Cory (1892a), Riley (1905a), and Todd and Worthington (1911).

Rose Island - There are 3 specs. in the MCZ from March 1915. The first, dated 1 March, is definitely from Rose Island. The second, dated 13 March, is from "Harriet" and the third, 21 March, is from "Roseville". Because I cannot locate these sites on maps nor do I know of any literature references, I am rather arbitrarily including these specs. here.

Eleuthera - 7 specs.: 4 from 16-30 Nov. 1891 (FM; Hellmayr 1935) and 3 from 31 Oct.-3 Nov. 1961 (LSU; Schwartz and Klinikowski 1963 identified this as D. d. albilora, the first record of this subspecies in the Bahamas; also in Buden 1987a). Connor and Loftin (1985) found it to be a common winter resident primarily in stands of larger trees from 20 July-4 April. Reported in 5/5 CBC's.

Cat Island - Sighting, 16 Aug. (Buden 1987c).

San Salvador - 8 specs.: 7 from 3-19 Oct. 1891 (FM; Cory 1892b, Hellmayr 1935) and 1 on 27 Dec. 1963 (LSU).

Noted by Todd and Worthington (1911); listed by Cory (1892a) and Riley (1905a).

Cay Lobos - Birds hit the lighthouse on 21 and 23 March 1901 (Bonhote 1903b). Listed by Riley (1905a).

Acklins Island - Listed by Buden (1987a).

West Plana Cay - Listed by Buden (1987a).

Mayaguana - 3 specs.: 1 each on 22 Aug. 1891 (FM; Cory 1892b, Hellmayr 1935, Buden 1987a) and 1 and 19 Oct. 1976 (LSU). Listed by Cory (1892a) and Riley (1905a).

Great Inagua - 4 specs.: 3 from 27 Feb.-1 March 1891 (FM; Cory 1891b, Hellmayr 1935) and 1 from 5 Dec. 1960 (LSU; Buden 1987a indicated that this spec., actually from adjacent Sheep Cay, had tentatively been identified as D. d. stoddardi). Noted by Todd and Worthington (1911) listed by Cory (1892a) and Riley (1905a).

Providenciales - 1 spec., 23 Feb. 1972 (LSU; Buden 1987a identified this as D. d. albilora). 1 ind. banded, 27 Dec. 1983 and recaptured, 16 Feb. 1984 (Buden 1987a). Sighting, 26 March 1978 (Buden 1987a).

Middle Caicos - 1 spec., 23 Feb. 1972 (LSU).

South Caicos - 1 spec., 20 Jan. 1961 (LSU); listed by Buden (1987a).

Grand Turk - 1 spec., 25 Jan. 1961 (LSU; Buden 1987a indicated that this spec. had been tentatively identified as D. d. stoddardi). Reported in the 1985 CBC.

Dendroica pityophila - Olive-capped Warbler. This species breeds on Grand Bahama, Great Abaco, and Cuba. It was originally described from Cuban material. Cory (1891c) described D. p. bahamensis from Abaco, and indicated that it also occurs on Grand Bahama. However, in Todd and Worthington (1911), Todd wrote that "unless skins in absolutely fresh plumage show decided differences [between Cuba and the Bahamas] the name "bahamensis" must necessarily be relegated to synonymy, despite the gap in the distribution of the species." This advice has been followed since (although Hellmayr 1935 reiterated the desirability of comparing fresh material). A number of authors have commented on the limitation of this species to the higher branches of pine trees (Allen 1905, Riley 1905b, Todd and Worthington 1911, Bond 1930, 1950, Emlen 1977).

Grand Bahama - 39 specs. located: 1 on 29 June 1891 (FM; Cory 1891d, Hellmayr 1935), 1 on 18 July 1908 (MCZ), 1 each on 16 April and 13 May 1936 (MCZ), 4 from 22 Feb. 1942 (3 in CM, 1 at Cornell), 2 from 26 and 28 April 1946 (CM), 5 from 2-11 Nov. 1960 (LSU), 17 from 13 Jan.-3 Feb. 1968 (15 at LSU, 2 at Royal Ontario Museum [ROM]), 2 from 6 and 8 Sept. 1970 (SWK), and 5 from 17-18 Aug. 1978 (USNM). Allen (1905) noted a 17 July 1904 spec. (not located). Emlen (1977) estimated density to be 72.0/km². Listed by Cory (1892a), Riley (1905a), and Bond (1950).

Great Abaco - 29 specs.: 4 from 8-29 June 1891 (3 in FM, 1 AMNH; Cory 1891d, Hellmayr 1935), 1 on 22 July 1903

(USNM; Riley 1905b), 13 from 24-28 April 1909 (8 in CM, 2 AMNH, 1 each in MCZ, UMMZ, and Cornell; Todd and Worthington 1911), 1 on 6 March 1933 (ANSP), 5 from 13-17 April 1946 (4 CM, 1 UMMZ), 4 from 10-15 April 1965 (LSU), and 1 on 26 July 1971 (ROM). Listed by Cory (1892a), Riley (1905a), and Bond (1950). Reported on the 1974 CBC.

Little Abaco - Listed by Lowery and Monroe (1968).

Dendroica pinus achrustera - Pine Warbler. Pine Warblers had been noted in the Bahamas by authors as early as Bryant (1866) and early specimens were referred to variously as Dendroica pinus or D. vigorsii. New Providence birds were described as a distinct species, Dendroica bahamensis, by C. J. Maynard in a privately published leaflet entitled "Appendix to catalogue of the birds of the West Indies" on 29 Nov. 1899. The existence of this obscure description was noted by Allen (1900). Because that name was preoccupied (by Dendroica pityophila bahamensis Cory, 1891), Bangs (1900) renamed this species Dendroica achrustera and provided measurements and characteristics substantiating its distinctiveness from continental Pine Warblers. Ridgway (1902) simultaneously reduced the status of New Providence birds to that of a subspecies (D. vigorsii achrustera) and described Abaco birds as a new, distinct subspecies (D. v. abacoensis). In Todd and Worthington (1911), Todd concluded that there were no constant differences between Abaco and New Providence birds, except that Abaco birds have a

slightly larger bill. This he did not consider sufficient to merit subspecific status; achrustera has been applied to all Bahaman birds since. Todd and Worthington (1911) commented that the birds were "common wherever there are pine barrens, and doubtless not going beyond their extent. They seldom come near the ground to feed, confining themselves to the upper branches much more closely than the bird of the Eastern States."

Grand Bahama - 16 specs.: 6 from 29 June 1891 (4 in FM, 2 in AMNH; Cory 1891d, Todd and Worthington 1911; Hellmayr 1935 noted 2 FM specs.), 3 from 17-18 July 1904 (MCZ; Allen 1905), 1 each on 17 May 1936 (MCZ) and 27 April 1946 (CM), 2 from 2 Nov. 1960 (LSU), and 3 from 31 Jan.-3 Feb. 1968 (LSU). Emlen (1977) estimated their density at 27.9/km², particularly in submature and young pines. Listed by Cory (1892a) and Bond (1930, 1950).

Great Abaco - 35 specs.: 1 April 1886 (USNM; Ridgway 1891, Todd and Worthington 1911), 9 from 8-17 June 1891 (FM; Cory 1891d, Hellmayr 1935), 1 on 22 July 1903 (USNM; Riley 1905b), 10 from 26 April-8 May 1909 (8 in CM, 1 each in AMNH and MCZ; Todd and Worthington 1911), 8 from 13-18 April 1946 (CM), 3 from 12-13 April 1965 (LSU), and 3 from 24-25 July 1971 (ROM). A density of 50 pairs/40 hectares has been estimated for Great Abaco (Karr and Roth 1971). Listed by Cory (1892a), Riley (1905a), and Bond (1930, 1950). Reported in the 1974 CBC.

Andros - 22 specs.: 1 on 23 April 1896 (BMNH), 2 from 17 April 1909 (CM; Todd and Worthington 1911), 6 from 29-30 April 1915 (MCZ), 1 each on 10 March and 28 Nov. 1968 (both LSU), 4 from 20 July 1971 (ROM), and 7 from 4-9 Aug. 1978 (USNM). Northrop (1891) noted 5 1890 specs. (not located) and listed insects and small fruits as contents of stomachs examined. Walkinshaw and Walkinshaw (1961) observed birds frequently at many localities. Listed by Cory (1892a) and Bond (1930, 1950). Reported in 5/5 CBC's.

New Providence - 51 specs.: 4 from 31 Dec. 1878-23 Jan. 1879 (3 in FM, 1 in BMNH; Todd and Worthington 1911 noted 2 of these), 2 from 16 June 1879 (FM; Hellmayr 1935 noted all 5 FM specs.), 1 on 19 April 1886 (USNM; Ridgway 1891 noted this and another from 17 April; Todd and Worthington 1911 noted the 19 April spec. only), 5 from 6-24 March 1897 (MCZ; Bangs 1900, Todd and Worthington 1911), 2 from 28 May 1897 (MCZ; Bangs 1900), 1 from 25 July 1897 (MCZ;), 2 on 12 Dec. 1901 (BMNH; Bonhote 1903a), 1 on 3 March 1902 (AMNH; Bonhote 1903a), 4 from 20-21 May 1902 (2 each in AMNH, Cornell; Todd and Worthington 1911 noted the former 2), 9 from 19-20 July 1903 (USNM;), 8 from 28 Dec. 1908-18 Jan. 1909 (6 in CM, 1 each in AMNH and MCZ; Todd and Worthington 1911), 1 on 23 May 1915 (MCZ), 3 from 25 Jan.-18 March 1922 (AMNH;), 5 from 23 Jan.-2 Feb. 1949 (UMMZ;), and 3 from 26 Nov. 1960 (LSU;). Bonhote (1899) noted a 17 March 1898 spec. (not located). Allen (1905) considered the birds common and observed a female feeding a fully-grown young on 26 July. Brudenell-

Bruce (1975) felt that nesting reached its peak in June. Listed by Cory (1892a), Riley (1905a, 1905b), and Bond (1930, 1950).

Harbor Island - Sighting, 16-22 Oct. 1972, subspecies not determined (Connor and Loftin 1985).

Cay Sal - 1 spec. reported, May 1891 (Cory 1891f, Hellmayr 1935; not located). This spec. was identified as D. p. achrustera by Hellmayr (1935) and Bond (1966), and identified as a vagrant by Bond (1970). Buden and Schwartz (1968) pondered the explanation for the occurrence of a non-migratory form so far outside of its range on an island lacking even isolated pine trees. Tropical storms tend to blow away from Cal Sal toward islands inhabited by achrustera and are not a likely explanation. The authors suggested that this might be a continental form with characteristics much like Bahaman birds, but conceded that continental birds are accidental in the West Indies (one Cuba record) and that this is also not likely. Listed by Cory (1892), Bond (1950), and Buden (1987b).

Dendroica kirtlandii - Kirtland's Warbler. This species breeds only in Michigan and winters only in the Bahamas. Records of its winter distribution have been summarized by Van Tyne (1951) and updated by Radabaugh (1974). Mayfield (1960), in reiterating much of Van Tyne's information, pointed out that the earliest known arrival date in the Bahamas was 13 Nov. (1891, Eleuthera) and the latest 25

April (1887, New Providence) and that he was aware of a total of 71 specimens. Mayfield (1972), in summarizing what is known concerning habitat use of this species, concluded that the birds inhabit low, broad-leaved scrub, but not high scrub or coppice (trees 15 ft or taller). Presence or absence of pines above the scrub seems irrelevant, other than for perhaps encouraging the regimen of fire that may keep the scrub low enough for the birds. He concluded that "unfortunately for the searcher, low broad-leaved scrub is abundant on all the islands in the Bahamas." Radabaugh (1974) indicated that, even though the species is secretive in nature, collectors had considerably more success in finding birds prior to 1897 than they or other observers have had since. Population decline on the breeding grounds has been well documented (recently summarized by Probst 1986). In the Bahamas, this is now a rare bird that appears capable of occupying a habitat type that is abundant on a large number of islands. Brudenell-Bruce (1975) wrote that "1,000 birds become extremely elusive when dispersed over 4,400 square miles of land." Twomey (1936) found that a climograph that included temperature and precipitation from the months Dec.-April for the Bahamas falls directly within the range of data for the birds' breeding months in Michigan.

Grand Bahama - 1 ind. netted and banded in submature pine habitat, April 1969 (Emlen 1977, Mayfield 1972; Radabaugh 1974 indicated that Paul Fluck had by then banded

2 inds. and had observed at least 5 inds.). Sightings: 14 Nov. 1959; 19 Nov. 1960; late Dec. 1961; 24 Nov. 1962; 16 Nov. 1963; 12 Feb., 24 and 27 March, 27 April, 5 and 29 Aug., 2 Oct., and 13 and 27 Nov. 1964; 9, 15, and 17 Feb., and 16 Oct. 1965; and 21 and 22 Oct. 1966 (all in Hundley 1967). Bond (1968) expressed skepticism over some of these sightings, particularly those from Aug. Additional sightings: 16 Nov. 1963 (Blanchard 1965, perhaps the same sighting as from that date in Hundley 1967) and 28 Dec. 1969 (Mayfield 1972)

Great Abaco - 1 spec., 21 March 1891 (FM; Cory 1891b, Hellmayr 1935, Mayfield 1960). An undated spec. (MCZ) had been taken earlier on a vessel at sea off Abaco (between Abaco and Cuba). Various authors have indicated that it had been taken in the second week of Oct. 1841, before the species was described in 1852, but was ignored until identified by Baird (1865) (Cory 1890, Chapman 1898, Van Tyne 1951, Bent 1953). Sightings: 19 Nov. 1960 (of 3 inds., Bond 1961), Dec. 1962 and Nov. 1963 (both in Bond 1964), 9 and 11 Nov. 1967 (Bond 1968), and 13 Nov. 1987 (Norton 1988a). Ind. banded, early 1969 (Bond 1969, 1980). Listed by Cory (1892a), Ridgway (1902), Riley (1905a), Bond (1950), and Bent (1953). Cooke (1904) felt that it occurs in the Abaco group only in spring and fall migration.

Little Abaco - 1 spec., 20 March 1902 (AMNH; Bonhote 1903a, Van Tyne 1951, Mayfield 1960). Listed by Riley (1905a), Bond (1950), and Bent (1953).

Bimini Islands - Sighting, on Cat Cay south of the Biminis proper, 28 April 1907 (Chapman 1908, Van Tyne 1951, Bond 1957, Mayfield 1960).

Berry Islands - 1 spec. located, 3 April 1891 (FM; Cory 1891b, Hellmayr 1935). Van Tyne (1951) referred to 3 specs. from these islands, and Mayfield (1960) indicated that these 3 had all been collected at the same time. Sighting, 31 March 1984, Great Stirrup Cay (Dunnell and Dunnell 1985). Listed by Cory (1892a), Ridgway (1902), Cooke (1904), Riley (1905a), Bond (1950), and Bent (1953).

Andros - 1 spec., 9 Jan. 1879 (FM; Cory 1879, Hellmayr 1935, Van Tyne 1951, Mayfield 1960). Sightings: 16 Nov. 1967 and 30 March 1968 (Bond 1968). Listed by Cory (1886, 1890, 1892a), Ridgway (1902), Cooke (1904), Riley (1905a), Bond (1950), and Bent (1953). Reported in 1/5 CBC's.

New Providence - 23 specs.: 13 from 10 Jan.-24 March 1884 (5 in FM, 3 in AMNH, 3 in ANSP, and 2 in MCZ; Chapman 1898 noted 22 specs. collected by Maynard from 1 Feb.-29 March 1884; Hellmayr 1935 noted the FM specs.; Van Tyne 1951 indicated that this number actually consists of two independently collected series; Mayfield 1960 noted 24 collected by Maynard and 4 for Cory of the FM), 4 from 21 March-25 April 1887 (3 in USNM, 1 in UMMZ; Van Tyne 1951; Mayfield 1960 noted 8 specs. in this series), 1 each from 23 and 31 March 1893 (MCZ; Chapman 1898, Van Tyne 1951, Mayfield 1960), 4 March and 5 April 1897 (MCZ; Chapman 1898, Bangs 1900, Van Tyne 1951; Mayfield 1960 noted 4 from this

period), and 5 March 1913 (MCZ; Van Tyne 1951 and Mayfield 1960 noted this as well as another tentatively dated from 1915), and 1 undated (USNM). Chapman (1898) reported an additional spec. collected 18 April 1887 (I do not believe that this was included in the series listed above that includes this date). Van Tyne (1951) referred to 46 specs. from New Providence (others not located). Bonhote (1903) wrote that a spec. collected in April 1902 was too badly shot to be skinned (this was included in the totals given by Van Tyne 1951 and Mayfield 1960). Sighting, of 3 inds., 26 Feb. 1941 (Hundley 1967). Listed by Cory (1886, 1892a), Ridgway (1902), Cooke (1904), Riley (1905a), Bond (1950), and Bent (1953).

Hog Island - Sightings: 27 March 1957, in low, broad-leaved scrub (Challinor 1962), and 27 Aug. 1967 (Bond 1968).

Athol Island - 1 spec., 5 May 1897 (MCZ; Chapman 1898, Mayfield 1960). Listed by Cooke (1904), Riley (1905a), Bond (1950), and Bent (1953).

Eleuthera - 8 specs.: 5 from 13 Nov.-2 Dec. 1891 (FM; Hellmayr 1935, Van Tyne 1951, Mayfield 1960), and 3 from 20-22 April 1897 (MCZ; Chapman 1898, Van Tyne 1951, Mayfield 1960). Mayfield (1960) noted 2 Maynard specs. from 1884 (not located); Van Tyne (1951) also referred to a total of 10 Eleuthera specs. Sightings: 11 Nov. 1961 and 30 Nov. 1963 (Hundley 1967), 14 Dec. 1985 and 6 Feb. 1986 (Norton 1986a), and as late as 28 March (Norton 1986b). Listed by

Cory (1892), Ridgway (1902), Cooke (1904), Riley (1905a), Bond (1950), and Bent (1953).

Harbor Island - Sighting, 9 March 1956 (Bond 1957).

Cat Island - 1 spec., 20 Nov. 1890 (ANSP; Bond 1951, Van Tyne 1951, Mayfield 1960, Buden 1987c).

San Salvador - 5 specs.: 4 from 4-8 March 1886 (3 in USNM, 1 in AMNH; Ridgway 1891, Van Tyne 1951, Mayfield 1960) and 1 from 27 Dec. 1963 (LSU; Paulson 1966 collected this in dense low coppice). Miller (1978) wrote that "in our hundreds of man-hours in the field we have never seen the bird though always watchful for it." Listed by Cory (1892a), Ridgway (1902), Cooke (1904), Riley (1905a), Bond (1950), and Bent (1953).

Green Cay - 2 specs., 12 April 1886 (1 each in USNM and LSU; Ridgway 1891, Van Tyne 1951, Mayfield 1960). Listed by Cory (1892a), Ridgway (1902), Cooke (1904), Riley (1905a), Bond (1950) and Bent (1953).

Crooked Island - Sighting, probably of 1 ind., 11, 12, and 22 March 1973 (Radabough 1974, Bond 1976, Buden 1987a).

Great Inagua - Sighting, on 8 March in some year between 1935 and 1940 (by Bond, in Van Tyne 1951 and Buden 1987a). Listed by Bond (1950).

North Caicos - Sighting, 10 Feb. 1978 (Clench 1978, Bond 1982, Buden 1987a). Listed by Cory (1892a), Ridgway (1902), and Riley (1905a), but see discussion under Middle Caicos.

Middle Caicos - 1 spec., 9 Jan. 1891 (FM; Cory 1891b indicated that Winch had collected 2 spec. at this time; Hellmayr 1935 noted only 1; Buden 1987a found only 1 also, and "did not find an entry for another in Cory's catalogue"; he also indicated that "like all of Winch's Caicos material I examined, this specimen bears no additional locality data; I was unable to find any corroborations of the North, Middle and East Caicos records specifically listed by Cory").

Listed by Cory (1892a), Ridgway (1902), Riley (1905a), Bond (1950), Van Tyne (1951), Bent (1953), and Mayfield (1960).

East Caicos - Listed by Cory (1892a), Ridgway (1902), and Riley (1905a), but see discussion under Middle Caicos.

Dendroica discolor - Prairie Warbler. A specimen has been reported as early as 20 July; the earliest that I have located is from 10 Aug. There are many specimens from every month thereafter up until 29 April, with an extremely large concentration in March. A 13 May lighthouse-kill is the latest reported date.

Bryant (1859; repeated by Albrecht 1861) had "no doubt that this bird is a constant resident of the Bahamas, and breeds there; it had paired by the middle of April." Cory (1890) noted Bryant's comment, and stated further that "it is possible that a few individuals may remain through the summer, but there can be no doubt that most if not all of them leave the islands before the last of April. I did not meet with it after May 1." Bonhote (1899) added that "Mr.

Cory describes this bird as resident, but I did not observe it between the months of April and October, although it is the most abundant of the genus during the whole winter." Riley (1905b) commented that an immature in fall plumage collected on 20 July on New Providence "was probably bred on the island." However, because he searched for and did not find the bird in breeding season on Abaco or New Providence and Northrop failed to discover it on Andros, Bond (1930) concluded that "this warbler is but a winter visitor to these islands."

Grand Bahama - 8 specs., 7 from Grand Bahama, all 2 Dec. 1891-4 Feb. 1892 (FM; Hellmayr 1935 noted 9 FM specs.), and 1 from adjacent Sandy Cay from an unknown date in 1897 (MCZ; probably 24 March, through elimination of other possible dates given in Bangs 1900; there are several "Sandy Cays" in the Bahamas; I include this record here as this seems the most likely of the possibilities). Noted from Fortune Bay in Jan. 1971 (Emlen 1973). Emlen (1977) estimated its density at $16.7/\text{km}^2$, particularly in coppets and also old fields and submature pines. Listed by Cory (1892a) and Riley (1905a).

Great Abaco - 8 specs. located: 3 from 2-6 April 1886 (USNM; Ridgway 1891 noted 6 specs. from this period), 1 each from 18 and 21 March 1891 (FM; Cory 1891b; Hellmayr 1935 noted 3 FM specs.), 2 from 9 Feb. 1942 (CM), and 1 from 12 April 1946 (CM). Noted by Todd and Worthington (1911);

listed by Cory (1892a) and Riley (1905a). Reported in the 1974 CBC.

Little Abaco - 2 specs. reported, 22 and 27 March 1902 (Bonhote 1903a, not located). Listed by Riley (1905a).

Bimini - 8 specs.: 7 from 21-30 March 1891 (5 in FM, 2 in BMNH; Cory 1891b, Hellmayr 1935), and 1 from 23 Nov. 1967 (LSU). Vaurie (1953) first saw birds on 14 Aug. 1951 and considered it the most common warbler thereafter. Mayr (1953) considered it the second-most common warbler (after Palm Warblers [Dendroica palmarum]). Listed by Cory (1892a) and Riley (1905a).

Berry Islands - 2 specs., 1 and 3 April 1891 (FM; Cory 1891b; Hellmayr 1935 noted 3 FM specs.). Listed by Cory (1892a) and Riley (1905a).

Andros - 7 specs.: 5 from 25 Nov.-9 Dec. 1887 (FM; Hellmayr 1935), and 1 each from 28 March 1896 (BMNH) and 3 Feb. 1902 (BMNH; Bonhote 1903a noted a 1 Feb 1902 spec., surely the same ind., as well as a 15 Jan. 1902 spec. [not located]). Northrop (1891) collected specs. from 22 March-12 April 1890 (not located) and saw a few inds. in the latter part of April; he termed it "by far the most common of the migratory warblers." Walkinshaw and Walkinshaw (1961) mist-netted 10 inds. from 16-20 March 1960 and heard birds singing on three occasions. Listed by Cory (1892a) and Riley (1905). Reported in 5/5 CBC's, including 1 in which it was the most common migrant warbler.

New Providence - 39 specs. located: 4 from 26 Dec. 1878-23 Jan. 1879 (first 3 in FM, last BMNH; Hellmayr 1935 noted a total of 5 FM specs.), 3 from 18 March-16 April 1886 (USNM; Ridgway 1891 noted 7 specs. from this period), 10 from 14-24 March 1887 (USNM), 1 from 22 Nov. 1887 (FM; included in the total in Hellmayr 1935), 2 from 25 Feb. 1897 (MCZ; Bangs 1900), 1 ind. 1 April 1897 (ROM), 1 on 22 Feb. 1902 (AMNH; Bonhote 1903a noted this as well as specs. collected on 12 and 26 Dec. 1901 and 21 Feb. 1902), 10 from 3 Feb.-20 April 1913 (9 MCZ, 1 AMNH), 1 ind. 17 Jan. 1920 (AMNH), 3 from 3-25 Feb. 1922 (BMNH), and 1 each on 1 Feb. 1949 (UMMZ), 10 Aug. 1958 (UF), and 27 Nov. 1960 (LSU). In addition, Cory (1891a) noted specs. taken from 14 March-2 April 1891, Bonhote (1899) noted 4 specs. taken 8 April and 19 and 30 Aug. 1898 (with observations beginning 18 Aug., both on the pine-barrens and round the houses in the town; this was noted as an early date by Cooke 1904), Riley (1905b) wrote of a 20 July immature spec. (an early fall date, according to Nolan 1978), and Todd and Worthington (1911) referred to spec.(s) from Jan. 1909 (none located). An ind. was banded 6 March 1959 and recaptured at the same locale 10 Sept. 1959 (Nolan 1978). Sightings, 20 July (Nolan 1978) and 31 July (Bond 1959). Brudenell-Bruce (1975) listed extreme dates of 20 July and 13 May, but noted that most arrive by the end of Aug. and depart in late March. The 28 July sighting reported by Schwartz and

Klinikowski (1963) cannot be traced on the basis of their documentation. Listed by Cory (1892a) and Riley (1905a).

Eleuthera - 19 specs.: 3 from 12 March 1886 (USNM; Ridgway 1891 noted 6 specs. from this date), 13 from 14 Nov.-2 Dec. 1891 (11 FM, 2 BMNH; Hellmayr 1935 noted the FM specs.), 1 on 20 April 1897 (MCZ; Bangs 1900 indicated that this spec. actually came from adjacent Current Island), and 1 each from 5 and 7 Nov. 1961 (LSU). There is also 1 spec. from "Fleming's Key" from 29 April 1897 (MCZ). I cannot locate an island of that name and can only speculate that it refers to one of the cays near Fleeming (or Fleming on some older maps) Channel west of Eleuthera. Sighting, on adjacent Harbor Island, of several inds. in the first week of August 1951 (Bond 1952). Connor and Loftin (1985) considered this a common winter resident throughout Eleuthera from 30 July-12 April. Listed by Cory (1892a) and Riley (1905a, on both Eleuthera and Current Island). Reported in 5/5 CBC's.

Cat Island - 5 specs. located, 11 March 1886 (4 USNM, 1 California Academy of Science [CAS]; Ridgway 1891 noted 11 specs. from this date). 2 additional specs. reported, Nov. 1890 (Buden 1987c). Listed by Cory (1892a) and Riley (1905a).

Conception Island - 1 spec. reported, sometime in 1886 (Ridgway 1891, not located). Listed by Cory (1892a) and Riley (1905a).

San Salvador - 35 specs.: 2 from 4 and 8 March 1886 (USNM; Ridgway 1891 noted 13 specs. from 27 Feb.-9 March), 29 from 3-22 Oct. 1891 (26 FM, 3 BMNH; Cory 1892b, Hellmayr 1935), 1 ind. 24 March 1909 (CM; Todd and Worthington 1911), and 3 from 16-17 Aug. 1923 (USNM). Listed by Cory (1892a) and Riley (1905a).

Cay Sal - 1 spec. located, 19 April 1968 (LSU; Buden and Schwartz 1968 collected this and considered the species extremely abundant, particularly after a heavy influx of warblers on the night of 19-20 April). 1 additional spec. (no date) was listed by Hellmayr (1935).

Green Cay - 2 specs. located, 12 April 1886 (USNM; Ridgway 1891 noted 4 specs. from this date). Listed by Cory (1892a) and Riley (1905a).

Exuma Cays - Listed by Cory (1892a) and Riley (1905a).

Rum Cay - 11 specs., 1-6 March 1886 (9 USNM, 2 BMNH; Ridgway 1891 noted 20 specs. from this period). Listed by Cory (1892a) and Riley (1905a).

Cay Lobos - Birds struck the lighthouse on 25 March and 3 May 1900 (Bonhote 1901) and on 23 March, 15 April, and 13 May 1901 (Bonhote 1903b). Listed by Cooke (1904, with the two May records as late dates) and Riley (1905a).

Acklins Island - Listed by Buden (1987a).

Mayaguana - 9 specs.: 1 from 24 Aug. 1887 (FM) and 8 from 24 Aug.-9 Sept. 1891 (FM; Cory 1892; Hellmayr 1935 noted all 9 FM specs.). Listed by Cory (1892a), Riley

(1905a), and Buden (1987a, with 24 Aug. as an early date). Bent (1953) noted 8 Aug. as an earlier (undocumented) date.

Great Inagua - 19 specs.: 3 from 31 Jan.-16 Feb. 1888 (2 FM, 1 BMNH), 5 from 1-7 March 1891 (FM; Cory 1891b), and 11 from 13-25 Sept. 1891 (FM; Hellmayr 1935 noted all 18 FM specs.). Other spec.(s) reported, Feb. 1909 (Todd and Worthington 1911, not located). Sighting, 14 April 1977 (Buden 1987a). Listed by Cory (1892a) and Riley (1905a).

Little Inagua - Listed by Buden (1987a).

West Caicos - 1 spec., 31 Jan. 1891 (BMNH).

Providenciales - 1 spec. reported, March 1941 (Bond and Meyer de Schauensee 1944, not located). An ind. banded 17 Dec. 1981 was recaptured 10 Feb. 1982 (Buden 1987a).

North Caicos - Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Middle Caicos - 10 specs., 6 Jan.-6 Feb. 1891 (FM; Cory 1891b, Hellmayr 1935). Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

East Caicos - Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

South Caicos - Listed by Buden (1987a).

Grand Turk - Listed by Buden (1987a). Reported in the 1985 CBC.

Dendroica palmarum - Palm Warbler. Although there are specs. from as early as 1 Oct. and as late as 5 May, the bulk of records are from Nov. to April. Among common winter

residents, this is one of the more abbreviated periods of presence.

Grand Bahama - 28 specs.: 25 from 22 Dec. 1891-18 Feb. 1892 (FM; Hellmayr 1935 noted 26), 1 on 5 Oct. 1959 (BMNH), and 2 from 2 Nov. 1960 (LSU). 1 tower-kill, 22 Oct. 1966 (Kale et al. 1969). This was the most abundant migrant species observed (on at least 25 and 28 Jan. 1971) at blossoms of Agave braceana; several were seen territorially defending plants (Emlen 1973). Four banded between 30 Oct.-9 Nov. 1971 (Bond 1972). Emlen (1977) found 214.8/km², primarily in coastal brush, submature pines, and young pines. His figures indicate that about 65% of the winter resident community consisted of Palm Warblers and that this species was at least 4 times more abundant than the second most common species. Listed by Cory (1892a) and Riley (1905a).

Great Abaco - 2 specs.: 2 April 1886 (USNM; Ridgway 1891) and 8 Feb. 1942 (CM). Also, 2 spec. from Walkers Cay, 2 and 8 April 1946 and 1 spec. from Strangers Cay, 3 April 1946 (all CM). Listed by Cory (1892a) and Riley (1905a). The most common migrant warbler in the 1974 CBC.

Bimini - 2 specs., 23 March 1891 (FM; Cory 1891b, Hellmayr 1935). Vaurie (1953) noted it as a common winter resident. Mayr (1953) considered it by far the most common warbler in April 1952; he observed birds feeding on or near the ground. Listed by Cory (1892a) and Riley (1905a).

Berry Islands - 1 spec., 7 April 1891 (FM; Cory 1891b, Hellmayr 1935). Listed by Cory (1892a) and Riley (1905a).

Andros - 9 specs.: 1 undated (BMNH; this may be the spec. that Northrop 1891 referred to from 2 May 1890; in any case, Cooke 1904 and Bent 1953 noted 2 May as a late date), 4 from an unlisted date in Nov.-18 Dec. 1887 (FM; Hellmayr 1935), 1 each from 21 Jan. (BMNH) and 23 Jan. 1902 (AMNH; Bonhote 1903a noted 3 specs. from this period), and from 21 and 23 Nov. 1973 (CM). Walkinshaw and Walkinshaw (1961) observed birds daily from 16-26 March 1960, captured 3 inds. in nets, and occasionally heard a male singing. Sighting, 9 Aug. (Bond 1972). Noted by Todd and Worthington (1911) and listed by Cory (1892a) and Riley (1905a). Reported in 5/5 CBC's, including 4 in which it was the most common migrant warbler.

New Providence - 23 specs. located: 1 each from 20 March and 4 April of an unknown year (both MCZ), 1 each on 26 Dec. 1878 and 21 Jan. 1879 (both FM; Hellmayr 1935), 1 on 19 March and 4 from 15 and 16 April 1886 (USNM; Ridgway 1891 noted these plus an additional 3 specs.), 4 from 17-26 March 1887 (USNM), 1 each on 16 March 1898 (BMNH), 8 April 1898 (AMNH), 1 Oct. 1898 (AMNH; an early fall date according to Bent 1953), and 12 Oct. 1898 (BMNH; Bonhote 1899 collected these 4 as well 4 other specs. [not located]; he considered the species abundant in the gardens and yards of the town, where it lives chiefly on the ground), 1 on 12 Dec. 1901 (AMNH; Bonhote 1903a), 2 from 19 Jan. 1909 (CM; Todd and

Worthington 1911), 1 each from 21 Jan. 1922 (CM) and 22 Jan. 1949 (UMMZ), and 1 undated (USNM). Cory noted an unspecified number of specs. taken from 14 March-2 April 1891 and Bangs (1900 noted a male taken 26 April 1897 (none located). Cory (1890) wrote that birds had all left by 15 April, and Cooke (1904) noted a 30 April late date (not in the above list of specs.). Bryant (1859) considered it extremely abundant in winter and early spring and commented that "its habits are decidedly terrestrial ... I did not see a single individual seeking for food amidst the large trees" (repeated by Albrecht 1861). Brudenell-Bruce (1975) listed extreme dates of 19 Sept. and 17 May, with most birds arriving in Oct. and leaving in early April; he wrote that they are "chiefly remarkable for their abundance; in winter one warbler in every two is a Palm." Listed by Bryant (1866), Cory (1892a) and Riley (1905a).

Eleuthera - 40 spec., 1 from Current Island on 26 April 1897 (MCZ) and 39 from Eleuthera: 3 from 12 March 1886 (USNM; Ridgway 1891), 31 from 1 Nov.-1 Dec. 1891 (28 FM, 3 BMNH; Hellmayr 1935 located 29 FM specs.), and 5 from 20 Oct.-5 Nov. 1961 (LSU). 111 inds. were captured in mist-nets from 26 Nov. 1978-30 April 1979 by Stewart and Connor (1980); they felt that birds showed some within-year site fidelity). Connor and Loftin (1985) considered it the most abundant warbler on the island and set extreme dates of 17 Sept. and 3 May. Listed by Cory (1892a) and Riley (1905a). The most common migrant warbler in all 5 CBC's.

Cat Island - 3 specs., 8-11 March 1886 (USNM; Ridgway 1891 noted 8 specs. from this period). Sighting, 26 Jan. 1909 (Todd and Worthington 1911). Listed by Cory (1892a), Riley (1905a), and Buden (1987c).

Conception Island - 1 spec., 8 March 1886 (USNM; Ridgway 1891 noted 3 specs.). Listed by Cory (1892a) and Riley (1905a).

San Salvador - 3 specs.: 1 each on 2 March 1886 (USNM; Ridgway 1891 noted 4 specs. from this time), 20 Oct. 1891 (FM; Cory 1892b, Hellmayr 1935), and 15 Feb. 1981 (USNM). Noted by Todd and Worthington (1911); listed by Cory (1892a) and Riley (1905a).

Cay Sal - 1 spec. located, 5 May 1897 (USNM). Buden and Schwartz (1968) noted an additional spec. dated 19 April and considered the species abundant. Birds struck the lighthouse on 13 March and 15 Dec. 1901 (Bonhote 1903b). Listed by Riley (1905) and Buden (1987b).

Green Cay - 4 specs: 3 from 12 April 1886 (USNM; Ridgway 1891) and 1 from 29 April 1902 (Cornell). Listed by Cory (1892a) and Riley (1905a).

Exuma Cays - Listed by Cory (1892a) and Riley (1905a).

Rum Cay - 11 specs., 1 March-2 April 1886 (9 USNM, 2 BMNH; Ridgway 1891 noted 17 specs. from 1-6 March). Listed by Cory (1892a) and Riley (1905a).

Cay Lobos - Birds struck the lighthouse on 29 and 30 Oct. and 22 Nov. 1900 and on 23 March and 15 April 1901 (Bonhote 1903b). Listed by Riley (1905a).

Fortune Island - Sighting, 9 March 1909 (Todd and Worthington 1911). Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Crooked Island - Listed by Buden (1987a).

Acklins Island - Noted by Todd and Worthington (1911) and listed by Buden (1987a).

West Plana Cay - Listed by Buden (1987a).

East Plana Cay - Sightings: a few in Ambrosia on beach terrace, Oct. 1967, and a few groups of 6-8 inds. along the beach and in the interior, March 1968 (Clough and Fulk 1971). Listed by Buden (1987a).

Mayaguana - Sighting, 29 Sept. 1976 (Buden 1987a).

Great Inagua - 6 specs.: 1 each on 31 Jan. and 8 Feb. 1888 and 27 Feb. and 5 May 1891 (all FM; Cory 1891e noted specs. from 1 May-10 July 1891; Hellmayr 1935 noted 4 specs.), and 2 from 16 and 24 Feb. 1909 (CM; Todd and Worthington 1911). At least 50 seen daily, 23-28 Dec. 1970, and a late sight report on 14 June 1976 (Buden 1987a). Listed by Cory (1892a) and Riley (1905a).

Little Inagua - 2 specs. reported, March 1941 (Bond and Meyer de Schauensee 1944, not located). Listed by Buden (1987a).

Providenciales - 3 specs. reported, March 1941 (Bond and Meyer de Schauensee 1944, not located). Birds banded on 24 Jan. 1981 (recaptured 2 April 1982) and 31 March 1983 (recaptured 25 April 1983) (Buden 1987a).

Parrot Cay - Listed by Buden (1987a).

North Caicos - Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Middle Caicos - 4 specs., all from 13 Jan.-6 Feb. 1891 (FM; Cory 1891b, Hellmayr 1935). Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

East Caicos - Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

South Caicos - Listed by Buden (1987a).

Big Ambergris Cay - Listed by Buden (1987a).

Little Ambergris Cay - Listed by Buden (1987a).

Grand Turk - More than 50 observed assembled to roost in mangroves, 27 Jan. 1978 (Buden 1987a). Reported in the 1985 CBC.

Dendroica castanea - Bay-breasted Warbler. All reports are from Oct. and Nov.

Grand Bahama - 1 tower-kill, 22 Oct. 1966 (Kale et al. 1969); 3 inds. banded (no dates, Bond 1980). Sightings: 3 Oct. 1962 (Bond 1963) and early Oct. 1987 (of 2 inds., Norton 1988a)..

New Providence - 1 spec. reported, 5 Nov. (Bond 1962, not located). Noted as a rare passage migrant from 4 Oct. to 5 Nov. by Brudenell-Bruce (1975).

Eleuthera - 1 spec. reported, 6 Nov. 1961 (Schwartz and Klinikowski 1963, not located). Sightings: 3 Oct. 1976 and 4 Oct. 1977 (Connor and Loftin 1985).

Dendroica striata - Blackpoll Warbler. Dates of fall specs. range from 21 Sept.-6 Nov.; the latest sighting is 29 Nov. In the spring, reports and specs. all fall within the period from 1 April to 24 May.

Grand Bahama - 1 spec., 20 Oct. 1959 (BMNH). 21 tower-kills, 22 Oct. 1966 (Kale et al. 1969). Emlen (1977) considered it an in-transit visitor from 15 April-13 May 1968 and from 21 April-18 May 1969. Sighting, 2 May 1987 (of at least 15 inds., Norton 1987b).

Abaco - Sighting, 4 May 1909 (Todd and Worthington 1911).

Bimini - Sighting, of 2 inds., 16 April 1952 (Mayr 1953).

Andros - 1 spec., undated (BMNH). This may have been among the specs. that Northrop (1891) obtained on 19-20 May 1890; he saw other birds 23 May "and even a day or two later."

New Providence - 11 specs. located: 12 May 1864 (USNM; Baird 1865), 1 on 24 May 1887 and 2 from 17 Oct 1888 (all USNM), 1 each on 1 and 29 April 1886 (USNM; Ridgway 1891 noted 3 specs. from this period), 1 each on 28 April, 5 May, and 12 and 14 Oct. 1898 (first and third in AMNH, other 2 in BMNH; Bonhote 1899 referred to a series of 6 taken more or less on these dates), and 1 on 6 May 1908 (BMNH). Bryant (1859) wrote that it was "very abundant from the 1st to the 10th of May [1859]" and that "in its habits, this bird approximates very nearly to the M. varia, climbing round the trunks of trees in search of insects apparently with the same facility as the latter bird" (quote also appears in Albrecht 1861 and Cory 1890). Although, from this description, it seems that Bryant may have misidentified some Black-and-white Warblers, the dates are well within those expected for Blackpoll Warblers. In the fall, "one bird was seen as late as Nov. 26, 1898" (Cooke 1904). Brudenell-Bruce (1975) noted extreme fall dates of 16 Sept. and 12 Nov. and extreme spring dates of 8 April and 7 June, with the main passage occurring around 10-15 May.

Eleuthera - 2 specs., 24 Oct. 1961 and 6 Nov. 1961 (both LSU). Connor and Loftin (1985) considered this "an uncommon fall and spring transient, 22 Sept. to 26 Oct. and

22 April to 3 May." Brudenell-Bruce (1975) indicated that a 29 Nov. Harbor Island report was the latest fall date in the Bahamas.

San Salvador - 37 specs., all 2-22 Oct. 1891 (32 FM [33 noted by Hellmayr 1935], 5 BMNH; Cory 1892b). Listed by Cory (1892a), Riley (1905a), and Bent (1953).

Cay Sal - 1 spec., 19 April 1968 (LSU; Buden and Schwartz 1968 collected this and considered the species among the most common of migrants; they witnessed a very heavy influx on 19-20 April 1968). Listed by Buden (1987b).

Anguilla - 1 spec. reported, 10-11 May 1891, at which time the species was noted to be abundant (Cory 1891f, not located); listed by Cory (1892a) and Riley (1905a).

Bird Rock (off Crooked Island) - Several inds. struck the lighthouse on 16 Oct. 1901 (Bonhote 1903b; also in Riley 1905a and Buden 1987a).

East Plana Cay - Sighting, in shrub thicket, Oct. 1967 (Clough and Fulk 1971; also in Buden 1987a).

Mayaguana - 1 spec., 30 Sept. 1976 (LSU; Buden 1987a collected this and described this species as "one of the most common birds on Mayaguana during first 2 weeks Oct. 1976").

Cay Lobos - 8 birds struck the lighthouse from 25 April-17 May 1900 (Bonhote 1901). One struck on 20 Oct 1900 and 7 more from 15 April-13 May 1901 (Bonhote 1903b). Listed by Riley (1905a) and Bent (1953).

Great Inagua - 19 specs.: 3 from 21-27 Sept. 1889, 14 from 27 April-23 May 1891, and 2 from 18 April 1892 (all FM; Cory 1891 indicated, probably incorrectly, that the end dates for the 1891 series were 1 May and 10 July; Hellmayr 1935 noted a total of 16 FM specs.). Subsequently listed by Cory (1892a) and Riley (1905a). Sighting, 29 Nov. 1973 (Buden 1987a).

West Caicos - Sightings, 28 Sept. and 2 Oct. 1987 (Norton 1988a).

Providenciales - Sighting, 21 April 1987 (Norton 1987b).

North Caicos - Sightings, 28 Sept. and 2 Oct. 1987 (Norton 1988a).

Grand Turk - Sighting, 26 April 1978 (Buden 1987a).

Dendroica cerulea - Cerulean Warbler.

New Providence - 1 banded, 18 Sept. 1960 (Bond 1961). Reported from 17-18 Sept. and 18 Oct. (Brudenell-Bruce 1975).

Cay Lobos - 2 inds. struck the lighthouse, 26 April 1901 (Bonhote 1903b). Listed by Riley (1905), Hellmayr (1935), and Bond (1950).

Mniotilta varia - Black-and-white Warbler. There is a spec. as early as 19 Sept. (and a sight report 4 Aug.) and one as late as 18 April (and a lighthouse-kill 3 May). There are a

fair number of records in Oct.-Nov., very few in mid-winter, and a major peak in March-April.

Grand Bahama - 2 specs. located, 2 Nov. 1960 (LSU). 2 additional specs., no dates indicated (Hellmayr 1935, not located). 5 tower-kills, 22 Oct. 1966 (Kale et al. 1969). Emlen (1977) considered it a winter resident present at a density of $4.5/\text{km}^2$, primarily in coppets but also in submature pines. Listed by Cory (1892a) and Riley (1905a).

Abaco - 3 specs.: 1 each on 20 March 1891 (FM; Cory 1891b; subsequently listed by Cory 1892a, Riley 1905a, and Hellmayr 1935), 15 April 1946 (CM), and 18 April 1965 (LSU). Todd and Worthington (1911) noted it as late as 6 May (date also in Bent 1953). Reported in the 1974 CBC.

Bimini - Specs. reported, March 1891 (Cory 1891b; not located; Hellmayr 1935 specified that 4 were in the FM). Vaurie (1953) reported observations from as early as 16 Aug. 1951.

Berry Islands - Specs. reported, March 1891 (Cory 1891b; not located; Hellmayr 1935 noted 2 in the FM).

Andros - 2 specs. located: 23 March 1896 (BMNH; this was among 3 specs. collected by Northrop 1891; he observed birds from 17 March 1890 and henceforth until the end of April) and 1 undated (UF). Listed by Cory (1892a), Riley (1905a), and Todd and Worthington (1911). Walkinshaw and Walkinshaw (1961) observed 6 in late March 1960, including 1 ind. netted on 23 March. Reported in 4/5 CBC's.

New Providence - 9 specs. located: 3 Jan. 1879 (FM; Hellmayr 1935), 19 March, 15 and 16 April 1886 (all 3 USNM; Ridgway 1891), 30 March 1897 (ROM), 16 Nov. 1898 (BMNH; Bonhote 1899 noted this spec. plus others on 15 April and 12 Oct. of the same year [these others not located]; he considered the species common, appearing in Sept. and leaving in April), 10 Dec. 1898 (AMNH), 4 March 1902 (BMNH; Bonhote 1903a collected this and another on 17 April [not located]), and 11 Jan. 1909 (CM; Todd and Worthington 1911). Cory (1891a) indicated that additional specs. were collected 14 March and 2 April 1891 (not located). Bryant (1859) considered it common from 20 April-10 May 1859 (noted by Albrecht 1861 and Cory 1890; the latter date is also in Cooke 1904). Brudenell-Bruce (1975) noted extreme dates of 31 July and 8 May; the species becomes common in Sept. and tends to leave in April. Listed by Cory (1892a) and Riley (1905a).

Eleuthera - 4 specs.: 2 March 1886 (USNM; Ridgway 1891 noted a spec., probably this one, but dated 12 March), and 1 each on 31 Oct., 2 and 3 Nov. 1961 (LSU). Hellmayr (1935) noted 3 FM specs. (not located); listed by Cory (1892a) and Riley (1905a). Sighting, 29 July 1956 (Bond 1957). Connor and Loftin (1985) considered it common throughout the island from 1 Aug. to 14 May. Reported in 5/5 CBC's.

San Salvador - 7 specs.: 2 from 9 March 1886 (USNM; Ridgway 1891) and 5 from 12-27 Oct. 1891 (FM; Cory 1892b,

Hellmayr 1935). Listed by Cory (1892a), Riley (1905a), Todd and Worthington (1911), and Bent (1953).

Cay Sal - 1 spec., 21 April 1968 (LSU; Buden and Schwartz 1968 also observed other inds.). Bonhote (1903b) noted 2 inds. on 13 March 1901 (Buden and Schwartz 1968 indicated that this note represented 2 specs.; if so, they have not been located). Listed by Riley (1905a) and Buden (1987b).

Green Cay - 1 spec., 13 April 1886 (USNM; Ridgway 1891 noted this and an additional spec. on the 12th that I have not located). Listed by Cory (1892a) and Riley (1905a).

Long Island - 2 specs., both 15 March 1976 (CM).

Rum Cay - 2 specs., 2 and 3 March 1886 (USNM; Ridgway 1891). Listed by Cory (1892a) and Riley (1905a).

Crooked Island - Listed by Buden (1987a).

Acklins Island - Listed by Buden (1987a).

Mayaguana - Listed by Buden (1987a).

Cay Lobos - Birds struck the lighthouse on 25 March and 2 and 3 May 1900 (Bonhote 1901) and 29 Oct. 1900, 21 and 27 March and 3 and 15 April 1901 (Bonhote 1903b). Listed by Cooke (1904) and Riley (1905a).

Great Inagua - 6 specs.: 1 each on 31 Jan. 1888, 28 and 29 April 1891 and 19, 21, and 22 Sept. 1891 (all FM; Hellmayr 1935). Listed by Todd and Worthington (1911) and Buden (1987a).

Little Inagua - Listed by Buden (1987a).

West Caicos - Listed by Buden (1987a).

Providenciales - 1 ind. banded 18 Dec. 1983 and recaptured 18 March 1984 (Buden 1987a).

Parrot Cay - Listed by Buden (1987a).

North Caicos - Listed by Buden (1987a).

East Caicos - Listed by Buden (1987a).

Grand Turk - Sighting, 4 Aug. 1977 (Buden 1987a).

Reported in the 1985 CBC.

Setophaga ruticilla - American Redstart. Most specs. are from March through 18 May. There are a few fall reports, including a 4 July sighting and a 21 Sept. spec., and a scattering of reports through winter, including several Jan. specs.

Grand Bahama - 3 specs.: 1 on 25 Jan. 1892 (FM; Hellmayr 1935) and 2 from 5 Oct. 1959 (BMNH). Five tower-kills, 22 Oct. 1966 (Kale et al. 1969). The winter density of this species has been estimated at $8.5/\text{km}^2$, primarily in coppets, with an influx of transients occurring in late April and early May (Emlen 1977). Listed by Cory (1892a) and Riley (1905a).

Abaco - Last sighted, 26 April 1909 (Todd and Worthington 1911). Reported in the 1974 CBC.

Bimini - 3 specs., 23-30 March 1891 (FM; Cory 1891b, Hellmayr 1935); listed by Cory (1892a) and Riley (1905a). Sightings: 4 May and 14 May 1947, when a large wave of birds was reported, and 14 Aug. 1951 (all in Vaurie 1953).

Berry Islands - 1 spec., 7 April 1891 (FM; Cory 1891b, Hellmayr 1935); listed by Cory (1892a) and Riley (1905a).

Andros - 1 spec. located, 5 May 1896 (BMNH). Northrop (1891) saw inds. first on 10 April, collected a spec. as late as 20 May 1890 (not located), and saw a bird in June. The first date of sighting by Bryant (1859) was 18 April 1859 and the latest date was 13 May (noted as a late date by Cory 1890). Cooke (1904) interpreted these dates to mean that the species does not winter "in any of the Bahamas within 400 miles of Florida." Observed in open growth and pine barrens by Todd and Worthington (1911) and on 22 March 1960 by Walkinshaw and Walkinshaw (1961). Brudenell-Bruce (1975) noted an unusual June report. Listed by Cory (1892a) and Riley (1905a). Reported in 5/5 CBC's.

New Providence - 11 spec. located: 15 Jan. 1879 (FM; Hellmayr 1935 noted 2 FM specs.), 6 inds. from 15-16 April 1886 (4 USNM and 1 each AMNH and Denver Museum of Natural History; Ridgway 1891 noted 9 specs. from 18 March-16 April), 1 on 30 Nov. 1898 (BMNH; Bonhote 1899 referred to 3 spec. from 28 and 29 April and 30 Sept. 1898; this Nov. spec. was collected by Bonhote, so there is either a discrepancy in dates or there are 3 additional specs. that I have not located), 1 each on 3 March 1902 (AMNH) and 19 April 1902 (BMNH; Bonhote 1903 collected these plus an additional ind. on the latter date [not located]; he considered the species to be a regular migrant in spring and autumn and felt that "solitary stragglers may occasionally

be found during the winter"), and 6 May 1908 (BMNH). In addition, Baird (1865) noted a 14 May 1864 spec., Cory (1891a) noted one from 29 March 1891 and Todd and Worthington (1911) referred to a 14 Jan. 1909 spec. (none located). Cooke (1904) referred to a spec. from 18 March 1891; it is not clear whether this is an additional unlocated spec. or a discrepancy in dates. Cory (1891) also noted sightings on 27 March (an early spring date according to Cooke 1904) and "a number" on 1 April 1891. Brudenell-Bruce (1975) noted extreme dates of 3 Aug. and 28 May. Listed by Bryant (1859), Albrecht (1861), Cory (1892a), Riley (1905a), and Bent (1953).

Eleuthera - This species has been reported as a common winter resident found throughout the island from 25 Aug.-25 May (Connor and Loftin 1985). It is surprising that there had been no previous reports. Reported in 5/5 CBC's.

Cat Island - Sighting, 4 July (Bond 1959, Brudenell-Bruce 1975, Buden 1987c). Listed, apparently without historical precedent, by Cory (1892a) and Riley (1905a).

Cay Sal - 1 spec. reported, 21 April (Buden and Schwartz 1968 noted this and called the species common; spec. not located); listed by Buden (1987b).

Anguilla - 4 specs., 9 May 1891 (FM; Cory 1891f; also in Cory 1892a, Riley 1905a, and Hellmayr 1935).

Green Cay - 2 specs., 12 and 13 April 1886 (USNM; Ridgway 1891); listed by Cory (1892a) and Riley (1905a).

Long Island - Listed by Cory (1892a) and Riley (1905a).

Rum Cay - 1 spec., 8 March 1976 (CM).

Crooked Island - Listed by Buden (1987a).

Acklins Island - Listed by Buden (1987a).

East Plana Cay - Sighted 4 times in buttonwood trees and shrubs, Oct. 1967 (Clough and Fulk 1971, also in Buden 1987a).

Mayaguana - Listed by Buden (1987a).

Cay Lobos - Birds struck the lighthouse on 2, 3, and 17 May 1900 (Bonhote 1901) and on 20 Oct. 1900 and 14 April and 13 May 1901 (Bonhote 1903b). Listed by Riley (1905a) and Bent (1953).

Great Inagua - 10 specs.: 25 Jan. 1879 (FM; Hellmayr 1935 noted a total of 9 FM specs.), 8 inds. from 21 April-18 May 1891 (FM; Cory 1891e indicated 1 May and 10 July end dates for this series), and 1 on 21 Sept. 1891 (also FM). Sighting, 29 Sept. 1976 (Buden 1987a). Noted by Todd and Worthington (1911) and listed by Cory (1892a) and Riley (1905a).

Little Inagua - Listed by Buden (1987a).

West Caicos - Listed by Buden (1987a).

Providenciales - 3 inds. banded: 29 Nov. 1980 (recaptured 29 Jan. 1981), 17 Dec. 1981 (recaptured 10 March 1982), and 21 Jan. 1981 (recaptured 2 April 1982) (all in Buden 1987a).

North Caicos - Listed by Buden (1987a).

Middle Caicos - Listed by Buden (1987a).

East Caicos - Listed by Buden (1987a).

Grand Turk - Listed by Cory (1892a), Riley (1905a), and Buden (1987a). Reported in the 1985 CBC.

Protonotaria citrea - Prothonotary Warbler. Most reports are from fall migration (Aug. and Sept. primarily, but as late as Nov.); there are also April records.

Grand Bahama - One photographed, Nov. 1962 (Bond 1963).

Abaco - 1 spec., 14 April 1965 (LSU; Paulson 1966). Sighting, 18 Sept. (Bond 1972). Conklin (1970) found a post-Colombian fossil in a cave.

Bimini - Sighting, 7 April 1952, of a bird feeding on arthropods on a dead fish lying on a beach (Mayr 1953).

Andros - 1 spec., 8 Aug. 1978 (USNM). Sightings: 10 Sept. (Bond 1969) and 13 Sept. (Bond 1972).

New Providence - 1 spec., 29 Aug. 1898 (BMNH; Bonhote 1899; also in Cooke 1904, Riley 1905a, Bond 1950, and Bent 1953). Brudenell-Bruce (1975) considered it an uncommon passage migrant from 6 Aug. to 12 Oct. and from 2-23 April.

Eleuthera - Listed by Bond (1956); Connor and Loftin (1985) considered it an uncommon transient from 4 Aug.-13 Oct., and 3 April-5 May, primarily near ponds.

Great Exuma - Sighting, 10 Aug. 1968 (Bond 1970).

Mayaguana - 1 spec., 12 Oct. 1976 (LSU; Buden 1987a collected this and saw several in the first 2 weeks of Oct. 1976).

Grand Turk - Sightings: 27 Aug. 1975, 5 Sept. 1976, and 20 Aug. 1977 (all in Buden 1987a).

Helmitheros vermivorus - Worm-eating Warbler. There is at least 1 spec. from every month from Sept. to April and reports from 30 July to 8 May. The greatest concentration of records is in March and April.

Grand Bahama - 1 spec., 14 Jan. 1892 (FM; Hellmayr 1935). 1 banded in early 1969 (Bond 1969), and others in Jan. and Feb. (Bond 1972). Sightings, in submature pines, 8 May 1968 and 13 March and 25 April 1969 (Emlen 1977).

Abaco - 3 specs.: 3 March 1886 (USNM; Ridgway 1891), 29 April 1909 (CM; Todd and Worthington 1911, also in Bent 1953), and on 4 April 1946 from Stranger's Cay, just northwest of Little Abaco (CM).

Bimini - Sightings: 18 Aug. 1951 (Vaurie 1953) and 7 April 1952 (Bond 1952).

Andros - 1 spec., 24 Nov. 1973 (CM). One netted, photographed, and banded, 25 March 1960 (Walkinshaw and Walkinshaw 1961). Sighting, 30-31 July (Bond 1969). Reported in 4/5 CBC's.

New Providence - 3 specs. located: 2 from 16 April 1886 (USNM; Ridgway 1891 noted these and another from 23 March of that year) and 1 from 18 Jan. 1909 (CM; Todd and Worthington 1909). Brudenell-Bruce (1975) listed extreme dates of 31 Aug. and 1 May. Also observed Nov.-Jan. (Moore 1877); listed by Cory (1890).

Eleuthera - Sightings: offshore on Harbor Island, 12 March 1956, and on Eleuthera itself, 23 Sept. 1956 (Bond

1957). Connor and Loftin (1985) considered it "a scarce winter resident from 19 Sept. to 25 April." Reported in 2/5 CBC's.

Cat Island - 2 specs. reported, 30 Nov. and 1 Dec. 1963 (Paulson 1966, not located; dates are from Buden 1987c).

Cay Sal - 1 spec. reported, 19 April 1968 (Buden and Schwartz 1968, not located; also in Buden 1987b).

Exuma - Sighting, from Great and/or Little Exuma (undated, Bond 1968).

Crooked Island - Sighting, 18 April 1972 (Buden 1987a).

Acklins Island - Sighting, 13 March 1973 (Buden 1987a).

Mayaguana - 1 spec., 8 Oct. 1976 (LSU; Buden 1987a collected this and saw several on 16 Oct. 1976).

Cay Lobos - A bird that struck the lighthouse on 5 April 1900 (Bonhote 1901) served as the basis for listing by Ridgway (1902), Riley (1905a), and Bond (1950).

Great Inagua - 1 spec., 22 Sept. 1891 (FM; Cory 1892; thereafter noted by Cory 1892a, Ridgway 1902, Riley 1905a, Hellmayr 1935, Bond 1950, Todd and Worthington 1911, and Buden 1987a).

North Caicos - 1 spec., 17 Feb. 1972 (LSU; Buden 1987a noted a sight report from this date). Additional sightings, 3-12 Feb. 1978 (Buden 1987a).

Grand Turk - Sightings: March (Bond 1971), 15 March 1972 and 29 Sept. 1977 (both in Buden 1987a).

Limnothlypis swainsonii - Swainson's Warbler. Meanley (1971) indicated that Bahaman reports probably represent transients to and from Cuba and Jamaica. All specs. are from March and April; other reports are concentrated in Sept., Feb. and March.

Grand Bahama - Bandings: 8 birds from 24 Feb.-5 April 1969 (Bond 1969, 1970), and of others on 14 and 18 Sept., 20 Jan., and 1, 24, and 26 Feb. (Bond 1972). By 1980, 36 inds. had been banded at one locale (Bond 1980).

Bimini - 1 spec., 2 March 1891 (FM; Cory 1891b, also cited by Ridgway 1902, Hellmayr 1935, and Bond 1950).

Andros - 1 spec., 23 March 1960 (UMMZ; Walkinshaw and Walkinshaw 1961, also in Bond 1961).

New Providence - 1 banded, 17 Sept. 1959 (Bond 1960). Brudenell-Bruce (1975) noted a 19 Sept. report.

Eleuthera - Connor and Loftin (1985) reported this "scarce spring transient" from 5 March 1979 and 6 May 1972. Bond (1986) repeated the latter date and Norton (1986a) reported a 22 Feb. sighting.

Cat Island - 1 spec., 3 March 1968 (LSU; Buden 1987c).

San Salvador - Sighting, 10 Dec. (Bond 1980).

Cay Sal - 1 spec., 24 April 1968 (LSU; Buden and Schwartz 1968 noted this and wrote that "due to its inconspicuous nature, [Swainson's Warbler] may be a more common transient in the Bahamas than indicated by the negligible number of reports"; spec. also noted by Bond 1970 and Buden 1987b)

Cay Lobos - 2 inds. struck the lighthouse on 23 March and another on 26 March 1901 (Bonhote 1903b; repeated by Riley 1905a and Bond 1950).

Seiurus aurocapillus - Ovenbird. Specs. have been collected from 19 Sept. through 15 May. Although there are peaks in fall (Oct.-Nov.) and spring (March-May), numbers remain high through the winter. There has been speculation, but no evidence, that this species has bred in the Bahamas (Riley 1905), specifically on Great Abaco (Todd and Worthington 1911) and Andros (Northrop 1891).

Grand Bahama - 5 specs.: 2 from 30-31 Dec. 1891, 2 from 11-13 Jan. 1892, and 1 ind. 31 Dec. 1892 (all FM; Hellmayr 1935). Listed by Cory (1892a) and Riley (1905a). 10 tower-kills, 22 Oct. 1966 (Kale et al. 1969); sighting, 15 Aug. 1962 (Bond 1963). Emlen (1977) listed this as a winter resident, primarily in coppet habitat, occurring at a density of 4.2/km²; he also noted an influx of transients in late April and early May.

Great Abaco - 5 specs. located: 1 each on 6 and 13 April 1886 (USNM; Ridgway 1891 noted 3 specs. from this period, including an earlier one on 27 March), 23 March 1891 (FM; Cory 1891b; Hellmayr 1935 noted 2 FM specs.), and 9 and 13 April 1946 (CM). Listed by Cory (1892a), Ridgway (1902), and Riley (1905a). Todd and Worthington (1911) saw birds as late as 3 May and concluded that the species "doubtless breeds" on Abaco; there is, however, no evidence for this.

Conklin (1970) found a post-Colombian fossil in a cave.
Reported in the 1974 CBC.

Bimini - 2 specs. located: 1 each on 21 March 1891 (FM; Cory 1891b; listed then in Cory 1892a and Riley 1905a; also in Hellmayr 1935) and 23 Nov. 1967 (LSU). Sighting, 4 May 1947 (Vaurie 1953).

Berry Islands - 3 specs., 2-5 April 1891 (FM; Cory 1891b, and thereafter in Cory 1892a, Riley 1905a, and Hellmayr 1935).

Andros - 1 spec. located, 1 Nov. 1887 (FM; Hellmayr 1935). Northrop (1891) collected specs. (not located) at several localities in 1890 and observed birds as late as the first week in May; stomachs he examined contained insects. He wrote that local residents felt the bird stayed year-round and "some said that they had seen its nest." The species was observed by Todd and Worthington (1911) and by Walkinshaw and Walkinshaw (1961), who captured 1 ind. in nets on 23 March 1960 and observed 2 others. Listed by Cory (1892a) and Riley (1905a). Reported in 3/5 CBC's.

New Providence - 18 specs. located: 1 each from sometime in Oct. 1876 (USNM) and 27 Dec. 1879 (FM; Hellmayr 1935 referred to 1 of the 2 FM specs. in this list), 19 March (USNM) and 15 April 1886 (AMNH; Ridgway 1891 noted 7 specs. from this time period), 17 March 1887 (USNM) and 15 Nov. 1887 (FM), 6 Feb. 1897 (MCZ; Bangs 1900; Bond 1950 referred to a 6 Feb. spec. identified as S. a. furvior [all others being S. a. aurocapillus] - this is the only spec.

from that day of the year of which I am aware), 15 and 25 April 1898 (BMNH; Bonhote 1899), 18 Feb. and 7 March 1902 (both AMNH; Bonhote 1903 collected these and another on 17 April of that year [not located]; he considered the species to be "a fairly common winter visitor of very skulking habits"), 9 Jan. 1909 (CM; Todd and Worthington 1911), 7 March 1913 (MCZ), 10 March 1921 (DNHM), 18 April 1922 (BMNH), 11 May 1923 (DENVER), 19 Jan. 1949 (UMMZ), and 27 Nov. 1960 (LSU). Baird (1865) referred to a 14 May spec., Cory (1891a) noted additional specs. collected from 14 March-2 April 1891, and Northrop (1891) noted one from Jan. 1890 (none located). The species had been noted by Bryant (1866) as late as April (also in Cory 1890). Among the above dates, the earliest is the unspecified date in Oct. and the latest is 11 May. Brudenell-Bruce (1975) noted 1 Sept. and 24 May extreme dates, but also pointed out that overwintering birds seem to leave by April and are replaced by a wave of migrants that lasts until mid-May. Listed by Cory (1892a), Ridgway (1902), and Riley (1905a).

Eleuthera - 18 specs.: 1 from 12 March 1886 (USNM; Ridgway 1891), 15 from 13 Nov.-2 Dec. 1891 (2 BMNH, 13 FM; Hellmayr 1935), and 2 from 21-22 Oct. 1961 (LSU). Listed by Cory (1892a), Ridgway (1902), and Riley (1905a). Connor and Loftin (1985) considered it a common winter resident throughout the island, primarily in damp, heavily vegetated areas, from 22 Aug.-8 May. Reported in 5/5 CBC's.

Cat Island - 1 spec., 11 March 1886 (USNM; Ridgway 1891; noted thereafter by Cory 1892, Riley 1905, and Buden 1987c).

San Salvador - 10 specs. located: 1 from 27 Feb. 1886 (USNM; Ridgway 1891 noted 3 from that date through 8 March) and 9 from 7-27 Oct. 1891 (FM; Cory 1892b originally referred to 13 specs., Hellmayr 1935 to 11). Noted by Cory (1892a), Riley (1905a), and Todd and Worthington (1911).

Cay Sal - Buden and Schwartz (1968) observed 2 inds. on 20 April and took 1 spec. on 21 April 1968 (not located). Noted by Buden (1987b).

Green Cay - 2 specs., 12-13 April 1886 (USNM; Ridgway 1891 indicated that 3 were taken at that time). Listed by Cory (1892a), Ridgway (1902), and Riley (1905a).

Long Island - 1 spec., 14 March 1976 (LSU). Listed by Cory (1892a) and Riley (1905a).

Rum Cay - 1 spec., 5 March 1976 (LSU). Listed by Cory (1892a) and Riley (1905a).

Cay Lobos - Birds struck the lighthouse on 2 and 17 May 1900 (Bonhote 1901) and then on 22 Nov. 1900 and 15 April and 13 May 1901 (Bonhote 1903b). These dates were noted by Cooke (1904) and Bent (1953).

Fortune Island - Listed by Buden (1987a)

Crooked Island - Listed by Buden (1987a)

Acklins Island - Noted by Todd and Worthington (1911) and listed by Buden (1987a).

East Plana Cay - Sightings, twice of single birds in Oct. 1967 (Clough and Fulk 1971). Listed by Buden (1987a).

Mayaguana - Listed by Buden (1987a).

Great Inagua - 16 specs.: 1 from 30 Jan. 1888, 2 from 3 March 1891, 1 from 24 April 1891, 11 from 2-15 May 1891, and 1 from 19 Sept. 1891 (all FM; Cory 1891b noted specs. from Jan. or Feb. 1891 and then [Cory 1891e] others between 1 May-10 July 1891; Hellmayr 1935 referred to 18 FM specs.). Noted by Todd and Worthington (1911); listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Little Inagua - Listed by Buden (1987a).

West Caicos - Listed by Buden (1987a).

Providenciales - Inds. banded 24 Dec. 1979 (recaptured 3 April 1982) and 21 Jan. 1981 (recaptured 17 April 1982) (Buden 1987a).

North Caicos - Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Middle Caicos - 4 spec., 2 each from 6 and 29 Jan. 1891 (FM; Cory 1891, Hellmayr 1935). Listed by Cory (1892), Riley (1905), and Buden (1987a).

East Caicos - Listed by Cory (1892), Riley (1905), and Buden (1987a).

South Caicos - 2 specs., 20 Jan. 1961 (LSU); listed by Buden (1987a).

Grand Turk - 1 spec., 25 Jan. 1961 (LSU; listed by Buden 1987a). Reported in the 1985 CBC.

Seiurus noveboracensis - Northern Waterthrush. There is a 30 Sept. spec. (and 13 and 18 Aug. sight reports) and a 17 May spec. Between these extreme dates, numbers of records are fairly constant, with no discernible peaks or valleys. Brudenell-Bruce (1975) wrote that "the Northern appears to tolerate drier conditions and saltier water, and so ranges more widely than the Louisiana."

Grand Bahama - 1 spec., 20 Jan. 1892 (FM; Cory 1892a, Riley 1905a, and Hellmayr 1935). 1 tower-kill, 22 Oct. 1966 (Kale et al. 1969); sighting, 13 Aug. 1962 (Bond 1963, Brudenell-Bruce 1975). Emlen (1977) considered it a winter resident occurring at a density of 10.3 birds per km² in marsh, coppets, and mangroves. He also indicated that transients arrive in early May.

Great Abaco - 2 specs.: 5 April 1886 (USNM; Ridgway 1891) and 23 March 1891 (FM; Cory 1891b, Hellmayr 1935). Reported in the 1974 CBC.

Little Abaco - 1 spec., 24 March 1902 (AMNH; Bonhote 1903a).

Bimini - Listed by Cory (1892a) and Riley (1905a); the only specific reference that I am aware of is a 4 May 1947 sight report (Vaurie 1953).

Berry - 1 spec., 8 April 1891 (FM; Cory 1891b and Hellmayr 1935).

Andros - 2 specs.: 12 Feb. 1958 (ANSP) and 19 Nov. 1960 (LSU). Reported in 2/5 CBC's.

New Providence - 9 specs. located: 1 Jan. 1879 (FM; Hellmayr 1935), 5 May 1884 and 15 March 1887 (both USNM), 4 Nov. 1890 (BMNH), 12 April 1898 (AMNH; Bonhote 1899 indicated that he had collected this as well as 2 others on 11 and 15 April 1898), 3 Jan. 1902 (BMNH; Bonhote 1903a), 2 inds. from 15 Jan. 1909 (CM; Todd and Worthington 1911 collected these and considered the species uncommon), and 1 ind. 26 Nov. 1960 (LSU). Bryant (1866) considered the species common in the first report from the island. Birds were also observed from 14 March-2 April 1891 (Cory 1891a). Brudenell-Bruce (1975) listed extreme dates of 19 Aug. and 28 May.

Eleuthera - 3 specs.: 25 Nov. 1891 (FM; the basis for listing by Cory 1892a, Riley 1905a, and Hellmayr 1935), 10 Feb. 1949 (UMMZ), and 22 Oct. 1961 (LSU). Connor and Loftin (1985) considered it a common winter resident in damp areas from 27 Aug. to 8 May. Reported in 5/5 CBC's.

San Salvador - 1 spec. located, 12 March 1909 (CM; Todd and Worthington 1911, who considered the species uncommon). Ridgway (1891) indicated that another spec. had been collected (no date, not located). Listed by Cory (1892a) and Riley (1905a).

Cay Sal - 1 spec. located, 17 May 1891 (FM; Cory 1891f, 1892a, Cooke 1904, Riley 1905a, Hellmayr 1935). Buden and Schwartz (1968) observed several in mangrove swamp habitat and collected a spec. (not located) on 20 April. Listed by Buden 1987b.

Mayaguana - 1 spec., 30 Sept. 1976 (LSU); listed by Buden (1987a).

Cay Lobos - Birds struck the lighthouse on 2 and 17 May 1900 (Bonhote 1901, also Cooke 1904) and on 30 Oct. 1900 and 11 April 1901 (Bonhote 1903b).

Great Inagua - 6 specs.: 4 from 30 April-14 May 1891 (FM; Cory 1892b, Riley 1905a, Hellmayr 1935), 1 on 24 Feb. 1909 (CM; Todd and Worthington 1911), and 1 ind., 5 Dec. 1960 (LSU; Buden 1987a).

Little Inagua - Listed by Buden (1987a).

Providenciales - Listed by Buden (1987a).

Pine Cay - Listed by Buden (1987a).

Middle Caicos - Listed by Buden (1987a).

East Caicos - Listed by Buden (1987a).

Grand Turk - 1 spec., 28 Jan. 1961 (LSU; listed by Buden 1987a). Sighting, 18 Aug. 1977 (Buden 1987a). Reported in the 1985 CBC.

Seiurus motacilla - Louisiana Waterthrush. Birds have been recorded most frequently early in fall migration (16 July-8 Sept.) and spring migration (24 March-16 April); there are a few reports but no specs. from mid-winter.

Great Abaco - 1 spec. reported, 16 April (Paulson 1966, not located).

Bimini - 1 spec., 25 March 1891 (FM; Cory 1891b; subsequently referred to by Cory 1892a, Cooke 1904, Hellmayr 1935, Bond 1950, and Bent 1953). Vaurie (1953) first

observed a bird on 17 Aug. 1951 and found the species commonly thereafter (chiefly in mangroves).

Berry Islands - 1 spec., 11 April 1891 (FM; Cory 1891b, later in Cory 1892a, Cooke 1904, Hellmayr 1935, Bond 1950, and Bent 1953).

Andros - 1 spec., 24 March 1960 (UMMZ; Walkinshaw and Walkinshaw 1961 collected this and netted 5 from 19-21 March 1960). Reported in 1/5 CBC's.

New Providence - 1 spec., 16 July 1958 (UF). Listed by Cooke (1904) without specific documentation. Brudenell-Bruce (1975) listed extreme dates of 17 July and 17 April; the birds arrive in full strength in Aug. and start becoming scarce in Jan., generally disappearing altogether by late March.

Eleuthera - Connor and Loftin (1985) considered this "an uncommon winter resident from 17 July to 3 April." Reported in 5/5 CBC's.

Cat Island - 2 specs. reported (neither located): 17 July 1986 (1 partially decomposed spec.) and 24 July 1986 (both cited by Buden 1987c). Sightings: late Nov. 1963 (Paulson 1966), 7 Aug. 1982, and 2 inds. on 24 July 1986 (both dates from Buden 1987c).

Exuma - Sighting, undated (Bond 1968).

Cay Lobos - Bonhote (1903b) reported a lighthouse-killed bird from 26 March 1901; subsequently noted by Riley (1905) and Bond (1950).

Great Ragged Island - 1 spec. reported, 8 Sept. (Bond 1958, not located). Listed by Buden (1987a)

Providenciales - Sighting, 19-20 Oct. 1986 (of 2 inds., Norton 1987a).

North Caicos - Sighting, 26 July 1987 (Norton 1987c).

Oporornis formosus - Kentucky Warbler. Most reports are from fall (17 Aug.-8 Oct.); there are one Dec. and two April sightings.

Grand Bahama - Sighting, 13 Aug. 1962 (Bond 1963). Since then, 17 inds. have been banded, including at least 6 from 14 Sept.-8 Oct. (Bond 1980).

Abaco - 1 "captured", 14 Sept. (Bond 1972; apparently not preserved).

New Providence - Sightings: 23-24 Sept. 1960 (Bond 1961) and 15 April 1963 (Bond 1963). Brudenell-Bruce (1975) considered it a rare passage migrant from 11 Aug. to 12 Oct. and from 4-15 April.

Great Inagua - Sighting, 29 Dec. 1976 (Buden 1987a saw this "at close range for several minutes").

Providenciales- Sighting, 27 April (Norton 1982b, Buden 1987a).

Grand Turk - Sightings: 27 Aug. 1975 and 24 Sept. 1976 (both in Buden 1987a).

Oporornis agilis - Connecticut Warbler. This species winters in South America, but its migration route is the least known of any of the migratory warblers. Its fall and spring passage through the Bahamas is probably better documented than for any other region. Virtually all reports are from Oct. and May; a Feb. sight report has been questioned.

Grand Bahama - 1 banded, no date (Bond 1980).

Andros - Sighting, 25 Oct. 1967 (Bond 1968).

New Providence - 2 specs., 12 and 14 Oct. 1898 (BMNH; Bonhote 1899 collected these and wrote that birds "arrived in considerable numbers on the night of the 12th Oct. [1898],...but they remained only four or five days") Listed by Riley (1905a), Bond (1950), and Bent (1953). Sightings: 9 Nov. (Bond 1960) and during the "whole of Oct." (Bond 1962). Brudenell-Bruce (1975) noted it as a rare passage migrant from 23 Sept. to 18 Nov. and on 9 and 10 May.

Cay Sal - 2 specs., both 17 May 1891 (FM; Cory 1891f). These served as evidence for listing by Cory (1892a), Riley (1905a), Hellmayr (1935), Bond (1950), Bent (1953), Buden and Schwartz (1968), and Buden (1987b).

Mayaguana - 1 spec., 2 Oct. 1976 (LSU; Buden 1987a collected this and saw several others in the first two weeks of Oct. 1976).

Cay Lobos - 1 bird struck the lighthouse on 9 May 1901 at 7:30 A.M. (Bonhote 1903). Riley (1905), Bond (1950), and Bent (1953) made reference to this event.

Providenciales - Sighting, 27 February 1982 (Norton 1982b). Buden (1987a) considered this questionable.

Oporornis philadelphia - Mourning Warbler.

New Providence - Sightings: 23 Sept. 1960 and 23 Sept. 1962 (Brudenell-Bruce 1975); listed by the American Ornithologists' Union (1983).

Eleuthera - Sighting, 9 Nov. 1978 (Connor and Loftin 1985, also in Bond 1986).

North Caicos - Sighting, 30 Sept. 1987 (Norton 1988a).

Geothlypis trichas - Common Yellowthroat. The earliest spec. date is 12 Oct.; there is a 30 Sept. sight report. The number of reports is constant from Nov.-Feb., and then increases tremendously in March and April. The latest spec. date is 12 May; a "freshly dead" bird was found 9 June.

Grand Bahama - 14 specs.: 11 from 4-30 Jan. 1892 (FM; Hellmayr 1935), 1 ind. 22 Feb. 1942 (CM), and 2 from 3 Nov. 1960 (LSU). 5 tower-kills, 22 Oct. 1966 (Kale et al. 1969). Inds. were observed attempting to feed on or near an agave plant on 25 and 28 Jan. 1971 (Emlen 1973). The density of this species was estimated to be $50.1/\text{km}^2$, primarily in coastal brush, marsh, and old fields (Emlen 1977). Listed by Cory (1892a) and Riley (1905a).

Great Abaco - 28 specs. located: 4 from 2-12 April 1886 (USNM; Ridgway 1891 referred to 6 specs. from 25 March-12 April), 11 from 16-23 March 1891 (FM; Cory 1891b, Hellmayr

1935), 2 from 26-27 April 1909 (CM; Todd and Worthington 1911), 9 from 8-11 Feb. 1942 (CM), and 1 each from 4 April 1946 (CM) and 13 April 1965 (LSU). An additional spec. was taken 1 April 1902 (Bonhote 1903b, not located). Listed by Cory (1892a) and Riley (1905a). Reported in the 1974 CBC.

Bimini - 5 specs., 24-31 March 1891 (FM; Cory 1891b, Hellmayr 1935). 2 inds. (including 1 that was collected, but not located) came aboard ship near Bimini on 16 Feb. (Wetmore 1932). Sightings, 4 and 14 May 1947 (Vaurie 1953 reported these as well as a fairly fresh dead bird found on 9 June 1951). Listed by Cory (1892a) and Riley (1905a).

Berry Islands - 7 specs., 1-8 April 1891 (FM; Cory 1891b, Hellmayr 1935). Listed by Cory (1892a) and Riley (1905a).

Andros - 8 specs. located, 7 from Andros: 20 April 1884 (BMNH), 4 Jan., 25 Nov., and 4 Dec. 1887 (all FM; Hellmayr 1935), 19 March and 16 April 1909 (CM; Todd and Worthington 1911), and 23 Nov. 1960 (LSU); 1 from Calabash Cay, 22 April 1915 (MC2). Northrop (1891) collected 5 additional specs. from 12-19 April 1890 (not located). Bryant (1859, also in Cory 1890) wrote: "on the 20th of April, in the harbor of Grassy Creek, a flock of these birds commenced flying by the vessel, and continued without intermission for two hours. They did not fly in a compact body, but were constantly passing during this time, more or less being in sight the whole period. Many of them alighted on the vessel. All of them that I saw were males." Walkinshaw and Walkinshaw

(1961) captured 2 inds. in mist-nets on 20 March 1960 and observed at least 3 others. Listed by Cory (1892a) and Riley (1905a). Reported in 5/5 CBC's.

New Providence - A new species (Geothlypis restricta) was described from this island by Maynard (1886; Allen 1887 wrote that the original description in the American Exchange and Mart and Household Journal was so badly flawed with errors that a revised description of this and four other species was published, in the same journal, the following year; Allen wrote "Mr. Maynard most unwisely chose his medium for their publication"; I have been unable to locate the original publication; the type is in the BMNH). Bangs (1900) referred some of his specimens to restricta, but Bonhote (1903a) doubted the validity of the taxon, and Ridgway (1902) decided that the name applied to wintering Geothlypis trichas. The name restricta has not been used since. I will not differentiate between references to restricta and trichas in the following discussion. 69

specs., 2 from adjacent Hog Island, both 24 March 1897 (MCZ; Bangs 1900), 1 from Salt Cay, 5 May 1897 (MCZ; Bangs 1900), and 66 from New Providence: 4 from 28 Dec. 1878-23 Jan. 1879 (FM; Hellmayr 1935), 5 from 29 Jan.-8 April 1884 (3 in BMNH, 1 in MCZ), 3 from 19 March-15 April 1886 (USNM; Ridgway 1891 noted 4), 4 from 19 March-17 April 1887 (USNM), 1 on 15 Nov. 1887 (FM; Hellmayr 1935), 2 from 25 March 1893 (BMNH), 11 from 8 Feb.-13 April 1897 (MCZ; Bangs 1900), 3 from 14-21 Dec. 1901 (2 AMNH, 1 BMNH) and 2 on 4 Jan. and 19 Feb. 1902

(AMNH; Bonhote 1903a noted these last 5 plus 3 additional specs. from this time period), 9 from 28 Dec. 1908-18 Jan. 1909 (8 CM, 1 UMMZ; Todd and Worthington 1911), 4 from 2-7 March 1913 (MCZ), 1 on 28 Dec. 1908 (CM), 10 from 21 Jan.-23 Feb. 1922 (AMNH), and 1 each from 3 April 1922 (BMNH), 21 Oct. 1922 (AMNH), 24 Jan. 1949 (UMMZ), 20 Nov. 1953 (LSU), 26 Nov. 1960 (LSU), and 1 undated (USNM). Additional specs. (not located) were collected between 14 March-2 April 1891 (Cory 1891a) and on 19 Oct. and 6 Nov. 1898 (Bonhote 1899; noted as abundant). Bryant (1859) felt that they were still abundant as late as 10 May 1859 (also in Albrecht 1861 and Cory 1890). Brudenell-Bruce (1975) listed extreme dates of 3 Sept. and 24 May. Listed by Cory (1892a) and Riley (1905a; on New Providence and Hog Island).

Eleuthera - 24 specs.: 5 from 1-12 March 1886 (USNM; Ridgway 1891), 13 from 16 Nov.-2 Dec. 1891 (FM; Hellmayr 1935), and 6 from 20 Oct.-3 Nov. 1961 (LSU). Bangs (1900) indicated that there was at least 1 1897 spec. from adjacent Current Island (not located). Connor and Loftin (1985) considered the species common throughout the island from 9 Sept.-30 April. Listed by Cory (1892a) and Riley (1905a). Reported in 5/5 CBC's.

Cat Island - 1 spec., 11 March 1886 (USNM; Ridgway 1891). Listed by Cory (1892a), Riley (1905a), and Buden (1987c).

Conception Island - 1 spec., 11 March 1886 (USNM; Ridgway 1891). Listed by Cory (1892a) and Riley (1905a).

San Salvador - 9 specs.: 3 from 1-9 March 1886 (USNM; Ridgway 1891 noted 4), 4 from 17-19 March 1909 (CM; Todd and Worthington 1911; noted as being numerous on 19 March), and 2 from 17 Feb. 1933 (MCZ). Listed by Cory (1892a) and Riley (1905a).

Cay Sal - 2 specs. reported (neither located): May 1891 (Cory 1891f) and 18 April (Buden and Schwartz 1968; they observed birds daily through 24 April). 6 birds struck the lighthouse 13 March and another 15 Dec. 1901 (Bonhote 1903b; Bent 1953 noted the latter as an early spring date). Listed by Cory (1892a), Riley (1905a), and Buden (1987b).

Anguilla - 2 specs., 9 May 1891 (FM; Cory 1891). Listed by Cory (1892a) and Riley (1905a).

Green Cay - 3 specs., 12-15 April 1886 (USNM; Ridgway 1891 noted 6 specs. from these dates). Listed by Cory (1892a) and Riley (1905a).

Exuma Cays - 1 spec. from Highburn Cay, 8 April 1893 (BMNH).

Rum Cay - 6 specs.: 5 from 2-6 March 1886 (USNM; Ridgway 1891 noted 10 specs.) and 1 from 8 March 1976 (CM). Listed by Cory (1892a) and Riley (1905a).

Cay Lobos - Birds struck the lighthouse on 26 April and 2 and 3 May 1900 (Bonhote 1901) and on 29 Oct. 1900 (Bonhote 1903b). Listed by Riley (1905a).

Ragged Islands - 3 specs., 6-7 April 1907 (AMNH). Listed by Buden (1987b).

Crooked Island - Listed by Buden (1987a).

Acklins Island - Listed by Buden (1987a).

Mayaguana - 1 spec., 12 Oct. 1976 (LSU). Sighting, 30 Sept. 1976 (Buden 1987a).

Great Inagua - 2 specs., 1 and 12 May 1891 (FM; Cory 1891e; Hellmayr 1935). Listed by Cory (1892a), Riley (1905a), and Buden (1987a).

Little Inagua - Listed by Buden (1987a).

West Caicos - Listed by Buden (1987a).

Providenciales - Listed by Buden (1987a).

North Caicos - Listed by Buden (1987a).

Middle Caicos - Listed by Buden (1987a).

East Caicos - Listed by Buden (1987a).

South Caicos - Listed by Buden (1987a).

Grand Turk - Listed by Buden (1987a). Reported in the 1985 CBC.

Long Cay - Listed by Buden (1987a).

Geothlypis rostrata - Bahama Yellowthroat. Inter- (and intra-) island variation among the resident yellowthroats of the Bahamas caused considerable confusion among ornithologists first investigating the region. At one point, seven separate species were recognized (Ridgway 1902, Riley 1905a). Bangs (1900) noted three species on New Providence alone, and Ridgway (1902) described a fourth from that island. Bonhote (1903a), in particular, pointed out some of the anomalies in the status of these birds. Todd (1911) concluded that the problem "reduced to its lowest

terms, is seen to be quite simple. The confusion heretofore obtaining has been largely due ... to an imperfect understanding of the sequence of plumages involved, occasioned by a lack of material." That said, he reduced the taxa to one species consisting of three allopatric subspecies: G. rostrata rostrata of New Providence and Andros, G. rostrata tanneri of Grand Bahama and the Abaco group (including Great Abaco, Little Abaco, and Moraine Cay), and G. rostrata coryi of Eleuthera. Subsequent authors (including Hellmayr 1935, Bond 1950, and Lowery and Monroe 1968) have followed these recommendations, and I refer the reader to Todd (1911) for a review of all earlier taxonomic references.

Schwartz (1970) re-examined this situation and concluded that New Providence and Andros birds were different from each other. He pointed out that, although the islands are close together, they are separated by a deep oceanic trench (the Tongue of the Ocean) that dips into the "U" of the Great Bahama Bank and have probably not been in contact with each other as recently as with other islands to the south. G. r. rostrata continued as the name of New Providence birds; Schwartz called Andros birds G. r. exigua (resurrecting the specific designation made for the island's birds by Ridgway 1902). This change was noted by Bond (1972, 1976). The only other recent suggestion of change in taxonomy was that rostrata (along with several Mexican

forms) be combined with G. trichas (Phillips 1962, noted by Bond 1963).

Grand Bahama - 47 specs.: 3 from 22-23 Dec. 1891 (FM;), 7 from 23-29 June 1891 (5 FM, 2 AMNH; Cory 1891d; Hellmayr 1935 noted a total of 11 FM specs.), 2 from 8 and 18 Jan. 1892 (1 FM, 1 AMNH), 2 from 17 July 1904 (MCZ; Allen 1905 collected these and observed birds "both in the swamps along shore and among the bushes in the dry pine woods"), 5 from 16 April to 14 May 1936 (MCZ), 8 from 2-11 Nov. 1960 (LSU), 11 from 13 Jan.-3 Feb. 1968 (LSU), and 9 from 17-18 Aug. 1978 (USNM). Bond (1972) noted a nest site "about a foot above the ground, concealed in a rank growth of grass" that had contained 2 eggs. Emlen (1977) estimated density at $32.2/\text{km}^2$, primarily in coppets, old fields, and young pines.

Great Abaco - 30 specs.: 4 from 27 March-6 April 1886 (USNM; Ridgway 1886, 1891), 4 from 22 June 1887 (USNM), 1 each on 23 March (FM; Cory 1891b), 13 and 15 June 1891 (FM; Hellmayr 1935 noted 3 FM specs.), 2 from 22 July 1903 (USNM; Riley 1905b), 7 from 24 April-6 May 1909 (6 CM, 1 DNHM; Todd and Worthington 1911; they thought the species very shy and retiring, but more common here than on New Providence), 1 on 7 March 1933 (ANSP), 2 from 11 April 1936 (MCZ), 1 on 10 Feb. 1942 (Bell Museum of Natural History, University of Minnesota), 5 from 10-16 April 1965 (LSU), and 1 undated (CM). King et al. (1979) found a female building a nest on 21 May 1977 1 m from the top of a 6 m tall pine tree in a mature pine stand (repeated by Bond 1980). The 2 previously

described nests had been near the ground. Reported in the 1974 CBC.

Little Abaco - 6 specs.: 3 from 22-30 March 1902 (BMNH; Bonhote 1903a), 2 from 11 July 1904 (MCZ), and 1 on 10 April 1936 (MCZ).

Walker Cay - 3 specs., 11 Feb. 1942 (CM).

Strangers Cay - 9 specs.: 6 from 9-10 Feb. 1942 and 3 from 3-4 April 1946 (all CM).

Moraine Cay - 4 specs., 13 July 1904 (MCZ; Allen 1905 collected these and observed an adult male feeding a full-grown young on 14 July).

Elbow Cay - Observed by Allen (1905); listed by Lowery and Monroe (1968).

Andros - 24 specs.: 4 from 20-24 April 1884 (3 BMNH, 1 FM), 5 from 25 Nov.-5 Dec. 1887 (FM; Hellmayr 1935), 1 on 24 April 1893 (BMNH; the type for G. exigua Ridgway 1902), 1 each on 30 March and 3 June 1896 (BMNH) and 17 April 1909 (CM; Todd and Worthington 1911), 7 from 21-20 April 1915 (MCZ), 1 from sometime in 1922 (AMNH), 1 on 15 Nov. 1960 (LSU), and 2 from 19-20 July 1971 (ROM). Northrop (1891) noted a 21 March 1890 spec. (not located) and commented that the bird "frequents the thick underbrush of the coppet, and was always seen quite close to the ground" Reported in 2/5 CBC's.

New Providence - 91 specs.: 1 each on 28 Dec. 1878 and 25 Jan. 1879 (FM), 29 from 27 Jan.-2 June 1884 (12 FM, 9 BMNH, 5 MCZ, 2 AMNH, 1 USNM; Hellmayr 1935 noted 17 FM

specs.), 1 each on 19 March 1886 (USNM; Ridgway 1891), 27 Feb. 1887 (USNM), 15 Nov. 1887 (FM), and 30 May 1889 (BMNH: the type for G. flavida Ridgway 1902), 3 from 23-25 March 1893 (BMNH), 29 from 6 Feb.-7 July 1897 (27 MCZ, 2 AMNH; Bangs 1900 noted 3 distinct species in this series), 1 each on 5 March and 10 Dec. 1898, 11 Dec. 1901, and 19 April 1902 (all BMNH; some of these and others noted by Bonhote 1899, 1903a; he wrote that because it inhabits thick low bush and is shy it probably is less scarce than it appears; "it is not, however, by any means abundant"), 18 June 1903 (USNM; Riley 1905b), and 1 Jan. 1904 (MCZ), 2 from 6-19 Jan. 1909 (CM; Todd and Worthington 1911 collected these and commented on the birds' "persistence in keeping in the very thickest cover"), 3 from 21 Feb.-7 March 1913 (MCZ), 7 from 24 Feb.-27 May 1915 (6 MCZ, 1 AMNH), 1 each on 17 Jan. and 4 April 1922 (AMNH and BMNH), and 2 from 29 Jan.-3 Feb. 1949 (UMMZ; Van Tyne and Mayfield 1952 collected these in tall deciduous brush). Schwartz (1970) has "not seen the bird on New Providence, despite regular search for it over several years." Brudenell-Bruce (1975) considered this a rare resident, having failed to encounter the bird from Dec. 1958 to April 1963. Bond (1976) took this to mean that this nominate race is in danger of extinction, probably due to overdevelopment of the island. Bond (1971) wrote that this species has become very scarce and is in danger of extirpation on New Providence.

Eleuthera - 13 specs.: 2 from 12 March 1886 (USNM; Ridgway 1886, 1891), 4 from 15-16 July 1891 (3 FM, 1 AMNH; Cory 1891d), 3 from 16-23 Nov. 1891 (FM; Hellmayr 1935 noted 6 specs.), 1 each on 23 April 1897 (MCZ), 10 Feb. 1934 (MCZ), 7 March 1968 (LSU), and 1 undated (USNM). Bryant (1866), in describing the species, noted 3 specs. that I have not located. He wrote (repeated by Cory 1890) that "the stomach and esophagus of one contained the head and body of an Anolis, which without tail measured ten inches and a half in length, showing rather a carnivorous propensity for a bird of this family." Collett (1957) described a nest in a broken stump 2 ft above the ground that contained partly fledged young on 19 June. Schwartz (1970) did not see a bird in 18 days of search, and took this to mean that the species, at the least, is not common. Connor and Loftin (1985) wrote that this is an uncommon permanent resident in fields and pastures in the northern part of the island, but is scarce in other parts. Reported in 4/5 CBC's.

Cat Island - 2 specs., 30 Nov.-1 Dec. 1963 (LSU; Paulson 1966, also in Buden 1987c). Buden (1987c) considered this a fairly common resident in woodlands and dense scrublands, generally low in the vegetation. He also collected 5 specs. on 2-3 March and 5 others during May-July 1986 (none located). These authors placed the Cat Island population in G. r. coryi, otherwise known from Eleuthera. Schwartz (1970) concurred with this placement.

Exuma - Bond (1984) considered his own sight report to be questionable.

Long Island - J. R. Miller felt that a bird he saw in winter was rostrata, but considered the identification questionable (as did Bond 1980, 1984).

Little Inagua - A sight report in March 1976 (by Clench) was considered questionable by Bond (1984) and Buden (1987a).

Wilsonia citrina - Hooded Warbler. There is at least one report or spec. from every month from Sept. to April, with the largest numbers in Oct. and April. There is, in addition to those listed, a spec. collected at an unspecified locale in the Bahamas (ANSP).

Grand Bahama - 1 banded, 19 April (Bond 1972); sightings: Nov. 1959 (Bond 1960), and on 2, 8, and 11 April 1968 (Emlen 1977).

Great Abaco - 1 spec. reported, 18 April (Paulson 1966, not located). A post-Colombian fossil was found in a cave (Conklin 1970).

Bimini - Sighting, 7 April 1952 (Mayr 1953).

New Providence - Sightings, 1 Oct. and 6 Nov. (Bond 1962). Brudenell-Bruce (1975) considered it an uncommon passage migrant, most frequently recorded in Oct., that occasionally overwinters; extreme dates are 3 Sept. and 28 April.

Eleuthera - At least 3 specs. reported (none located): 12 March (Bond 1956), and 23 and 25 Oct. 1961 (Schwartz and Klinikowski 1963 took these and observed others). Sightings: 13 Oct. (Bond 1956), 25 April 1977 and 20 Sept. and 31 Oct. (all in Connor and Loftin 1985). Reported in 1/5 CBC's.

Cat Island - Sighting (of a male), 29 Nov. 1963 (Paulson 1966, also in Buden 1987c).

San Salvador - Miller (1978) reported 10 sightings in Dec. 1973, 2 in Dec. 1974, 3 from 5-8 Feb. 1975, 8 in Dec. 1975, and 7 in Dec. 1976.

Cay Sal - 2 specs. reported, a male and a female, 20 April (Buden and Schwartz 1968, not located). Listed by Buden (1987b).

Acklins Island - Sighting, 11 March 1973 (Buden 1987a).

East Plana Cay - Sighting, Oct. 1967 (Clough and Fulk 1971, also in Buden 1987a).

Mayaguana - 1 spec., 12 Oct. 1976 (LSU; Buden 1987a collected this and saw several in black mangrove swamps from 9-16 Oct. 1976).

Cay Lobos - Bonhote (1903b) noted that an ind. struck the lighthouse on 15 April 1901. This was the basis for listing from the Bahamas by Cooke (1904), Riley (1905a), Bond (1950), and Bent (1953).

Great Inagua - Sighting, 29 Nov. (Bond 1974, Buden 1987a).

Grand Turk - 1 spec., 28 Jan. 1961 (LSU; Schwartz and Klinikowski 1963, Buden 1987a).

Wilsonia pusilla - Wilson's Warbler. There are fall and spring reports, but none specifically from mid-winter.

Grand Bahama - Sighting, 22 Oct. 1966 (Kale et al. 1969, also Bond 1970); 1 ind. banded, 29 Nov. (Bond 1972, 1980). Emlen (1977) considered it a winter resident with a density of 0.3/km². However, Bond (1978) indicated that Emlen's observation dates ranged only from 2-11 April. Brudenell-Bruce (1975) noted a 9 April report (perhaps from the same source).

Bimini - Sighting, 19 Sept. 1987 (Norton 1988a).

New Providence - 1 spec. reported, 18 Sept. (year not indicated) (Bond 1962, not located). Sightings: 17 and 24 Sept. 1961 (Brudenell-Bruce 1975).

Eleuthera - Sighting, 28 March 1976 (Connor and Loftin 1985, also in Bond 1986).

Wilsonia canadensis - Canada Warbler.

Grand Bahama - 4 had been banded by 1980 (Bond 1980).

New Providence - 1 spec. reported, 30 Sept. 1960 (Bond 1961, not located; the identity of this spec. was confirmed by Bond 1962, who also reported observations from 1-27 Oct.). Brudenell-Bruce (1975) considered it a rare autumn passage migrant from 2 Sept. to 12 Oct.

Exuma - Sighting, from Great and/or Little Exuma, undated (Bond 1968).

Icteria virens - Yellow-breasted Chat. All but one of the reports are from fall (16 Aug.-20 Nov.).

Grand Bahama - 1 ind. banded, 20 Nov. (Bond 1961; the first report from the Bahamas); another banded on 17 Nov. was recovered the following 9 March (Bond 1972, probably the same banding record in Bond 1980; dates are in Brudenell-Bruce 1975). Sightings ("at close range"), 16 and 17 Aug. 1963 (Bond 1965, Brudenell-Bruce 1975).

Abaco - 1 banded and another sighted, 18 Sept. (Bond 1972).

Bimini - Sightings (of 1 bird, presumably), 17 and 19 Nov. (Paulson 1966, Brudenell-Bruce 1975).

Andros - 1 banded, 27 Oct. (Bond 1969). Sightings: early Nov. (Bond 1969) and 1 Nov. (Bond (1972)).

Eleuthera - Sighting, 20 Oct. 1977 (Connor and Loftin 1985, also in Bond 1986).

DISCUSSION

Five species of warblers breed in the Bahamas.

Dendroica petechia has been found virtually everywhere;

Dendroica dominica and Dendroica pityophila breed on Grand Bahama and Great Abaco; Dendroica pinus is on those islands as well as Andros and New Providence; Geothlypis rostrata is

on those islands (including others in the Abaco group) as well as on Eleuthera and Cat Island. With five breeding species each, Grand Bahama and Great Abaco are occupied by more resident warbler species than any other island in the West Indies.

^{Thirty eight}
 38 species of migrants have been reported from the Bahamas (including Dendroica dominica, which is in both lists). Ten of these species commonly overwinter: Parula americana, Dendroica tigrina, Dendroica coronata, Dendroica dominica, Dendroica discolor, Dendroica palmarum, Helmitheros vermivorus, Seiurus aurocapillus, Seiurus noveboracensis, and Geothlypis trichas. Four others overwinter, but are less common: Vermivora pinus, Dendroica virens, Dendroica kirtlandii, and Wilsonia citrina. Three species, Dendroica caerulescens, Mniotilta varia, and Setophaga ruticilla, are common in passage and uncommon in winter. Dendroica striata and Seiurus motacilla occur in passage, but generally not in winter. Three species pass through rarely to and from regular wintering grounds to the south of the Bahamas: Protonotaria citrea, Limnothlypis swainsonii, and Oporornis agilis; Vermivora bachmanii formerly (and may still) fall into this category. Ten species occur during periods of migration, but do not seem to be en route to any normal wintering range: Vermivora peregrina, Vermivora celata, Vermivora ruficapilla, Dendroica pensylvanica, Dendroica magnolia, Dendroica fusca, Dendroica castanea, Oporornis formosus, Wilsonia pusilla,

and Icteria virens. The remaining five species should be considered strictly accidental (or perhaps, in some cases, hypothetical): Vermivora chrysoptera, Dendroica townsendi, Dendroica cerulea, Oporornis philadelphia, and Wilsonia canadensis.

LITERATURE CITED

- Albrecht, R. 1861. Die Vogel der Bahama-Inseln. J. f. Ornithologie 9:48-60.
- Allen, G. M. 1905. Summer birds in the Bahamas. Auk 22:113-133.
- Allen, J. A. 1887. Maynard on "Five new species of birds from the Bahamas." Auk 4:155.
- _____. 1900. New birds from the Bahamas. Auk 17:187.
- American Ornithologists' Union. 1983. Check-list of North American birds. 6th ed. American Ornithologists' Union, Washington, D.C. 877 p.
- Baird, S. F. 1865. Review of American birds in the Museum of the Smithsonian Institution. Part 1, North and Middle America. Smithsonian Misc. Coll. 181. 449 p.
- Bangs, O. 1900. Notes on a collection of Bahama birds. Auk 17:283-293.
- Bent, A. C. 1953. Life histories of North American wood warblers. Bull. U.S. Nat. Mus. 203:1-734.
- Blanchard, D. 1965. Kirtland's Warbler in winter of Grand Bahama Island. Jack-Pine Warbler 43:39-42.
- Bond, J. 1930 The resident West Indian warblers of the genus Dendroica. Proc. Acad. Nat. Sci. Phila. 82:329-337.
- _____. 1942. Additional notes on West Indian birds. Proc. Acad. Nat. Sci. Phila. 94:89-106.

- _____. 1950. Check-list of birds of the West Indies. 3rd ed. Wickersham Printing Co., Lancaster, Pa. 200 p.
- _____. 1951. First supplement to the check-list of birds of the West Indies. Acad. Nat. Sci. Phila. 22 p.
- _____. 1952. Second supplement to the check-list of birds of the West Indies (1950). Acad. Nat. Sci. Phila. 24 p.
- _____. 1956. First supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 8 p.
- _____. 1957. Second supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 14 p.
- _____. 1958. Third supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 11 p.
- _____. 1959. Fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1960. Fifth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 6 p.
- _____. 1961. Sixth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1962. Seventh supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 11 p.
- _____. 1963. Eighth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 11 p.
- _____. 1964. Ninth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 13 p.
- _____. 1965. Tenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 16 p.

- _____. 1966. Eleventh supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 13 p.
- _____. 1967. Twelfth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 22 p.
- _____. 1968. Thirteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1969. Fourteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 10 p.
- _____. 1970. Fifteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 15 p.
- _____. 1971. Sixteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 15 p.
- _____. 1972. Seventeenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 11 p.
- _____. 1974. Nineteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1976. Twentieth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 14 p.

_____. 1977. Twenty-first supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 16 p.

_____. 1978. Twenty-second supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 20 p.

_____. 1980. Twenty-third supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 14 p.

_____. 1982. Twenty-fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 16 p.

_____. 1984. Twenty-fifth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 22 p.

_____. 1986. Twenty-sixth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 18 p.

_____ and R. Meyer de Schauensee. 1944. Results of the Fifth George Vanderbilt Expedition (1941). The Birds (p. 7-56). Monogr. Acad. Nat. Sci. Phila. 6. 583 p.

Bonhote, J. L. 1899. A list of birds collected on the island of New Providence, Bahamas. Ibis 1899:506-520.

_____. 1901. On a collection of birds made by Mr. T. R. Thompson at the Cay Lobos lighthouse, Bahamas. Auk 18:145-149.

- _____. 1903a. On a collection of birds from the northern islands of the Bahama group. *Ibis* 1903:273-315.
- _____. 1903b. Bird migration at some of the Bahama lighthouses. *Auk* 20:169-179.
- Brace, L. J. K. 1877. Notes of a few birds observed at New Providence, Bahamas, not included in Dr. Bryant's list of 1859. *Proc. Boston Soc. Nat. Hist.* 19:240-241.
- Brudenell-Bruce, P. G. C. 1975. The birds of New Providence and the Bahama Islands. Collins, London. 142 p.
- Bryant, H. 1859. A list of birds seen at the Bahamas, from Jan. 20th to May 14th, 1859, with descriptions of new or little known species. *Proc. Boston Soc. Nat. Hist.* 7:102-134.
- _____. 1866. Additions to a list of birds seen at the Bahamas. *Proc. Boston Soc. Nat. Hist.* 11:63-70.
- Buden, D. W. 1987a. The birds of the southern Bahamas. *Brit. Ornithol. Union Check-list No. 8*. London. 119 p.
- _____. 1987b. Birds of the Cay Sal Bank and Ragged Islands, Bahamas. *Florida Scientist* 50:21-33.
- _____. 1987c. The birds of Cat Island, Bahamas. *Wilson Bull.* 99:579-600.
- _____ and A. Schwartz. 1968. Reptiles and birds of the Cay Sal Bank, Bahama Islands. *Quart. J. Florida Acad. Sci.* 31:290-320.
- Challinor, D., Jr. 1962. Recent sight record of Kirtland's Warbler in the Bahamas. *Wilson Bull.* 74:290.

- Chapman, F. M. 1892. Notes on birds and mammals observed near Trinidad, Cuba, with remarks on the origin of West Indian bird-life. Bull. Amer. Mus. Nat. Hist. 4:279-330.
- _____. 1898. Kirtland's Warbler (Dendroica kirtlandii). Auk 15:289-293.
- _____. 1908. Camps and cruises of an ornithologist. D. Appleton and Co., New York. 432 p.
- Clench, M. H. 1978. Search ends: a Kirtland's at last. Audubon Soc. of Western Pennsylvania Bull. 42:1,8.
- Clough, G. C. and G. Fulk. 1971. The vertebrate fauna and the vegetation of East Plana Cay, Bahama Islands. Atoll Research Bull. No. 138. Smithsonian Inst., Washington, D. C. 17 p.
- Collett, F. M. 1957. Nesting of the Bahaman Yellowthroat. Wilson Bull. 69:183.
- Conklin, K. 1970. Post-Columbian birds from Abaco Island, Bahamas. Quart. J. Florida Acad. Sci. 33:237-240.
- Connor, H. A. and R. W. Loftin. 1985. The birds of Eleuthera Island, Bahamas. Florida Field Naturalist 14:77-104.
- Cooke, W. W. 1904. Distribution and migration of North American warblers. USDA Div. Biol. Surv. Bull. 18. U. S. Dept. Agric., Washington, D. C. 142 p.
- Cory, C. B. 1879. Capture of Kirtland's Warbler (Dendroica kirtlandi) in the Bahama Islands. Bull. Nuttall Ornithol. Club 4:118.

- _____. 1886a. The birds of the West Indies, including the Bahama Islands, the Greater and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Part I. Auk 3:1-59.
- _____. 1890. The birds of the Bahama Islands. 2nd ed. Estes & Lauriat, Boston. 250 p.
- _____. 1891a. A list of birds taken and observed in Cuba and the Bahama Islands, during March and April, 1891. Auk 8:292-294.
- _____. 1891b. List of birds collected by C. L. Winch in the Caicos Islands and Inagua, Bahamas, during January and February, and in Abaco, in March, 1891. Auk 8:295-298..
- _____. 1891c. Descriptions of new birds from the Bahama Islands, with remarks on the species of Speotyto which occur in the West Indies. Auk 8:348-349.
- _____. 1891d. List of the birds obtained by Mr. C. S. Winch on the islands of Great Bahama and Abaco, Bahama Islands, during June, and on Eleuthera in July, 1891. Auk 8:350-351.
- _____. 1891e. List of birds collected on the island of Inagua, Bahama Islands, from May 1 to July 10, 1891. Auk 8:351.
- _____. 1891f. On a collection of birds made on the islands of Anguilla and Cay Sal or Salt Cay, Bahama Islands, by Mr. Cyrus S. Winch, during May, 1891. Auk 8:352.

- _____. 1892a. Catalogue of West Indian birds, containing a list of all species known to occur in the Bahama Islands, the Greater Antilles, the Caymans, and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Published by the author, Boston. 163 p.
- _____. 1892b. A list of birds taken on Maraguana, Watling's Island, and Inagua, Bahamas, during July, August, September, and October, 1891. *Auk* 9:48-49.
- Dunnell, A. and K. Dunnell. 1985. Kirtland's Warbler at Great Stirrup Cay. *Jack-Pine Warbler* 63:61.
- Emlen, J. T. 1973. Territorial aggression in wintering warblers at Bahama agave blossoms. *Wilson Bull.* 85:71-74.
- _____. 1977. Land bird communities of Grand Bahama Island: the structure and dynamics of an avifauna. *Ornithol. Monogr.* 24, Amer. Ornithol. Union, Lawrence, Kansas. 129 p.
- Hellmayr, C. E. 1935. Catalogue of birds of the Americas and adjacent islands. *Field Museum Nat. Hist., Zool. Ser.* 13, Part 8:1-541.
- Hundley, M. H. 1967. Recent wintering records of the Kirtland's Warbler. *Auk* 84:425-426.
- Kale, H. W., II, M. H. Hundley, and J. A. Tucker. 1969. Tower-killed specimens and observations of migrant birds from Grand Bahama Island. *Wilson Bull.* 81:258-263.

- Karr, J. R. and R. R. Roth. 1971. Vegetation structure and avian diversity in several New World areas. Amer. Naturalist 105:423-435.
- King, W. B., N. F. R. Snyder, M. Segnestam, and J. Grantham. 1979. Noteworthy ornithological records from Abaco, Bahamas. Amer. Birds 33:746-748.
- Lowery, G. H., Jr., and B. L. Monroe, Jr. 1968. Family Parulidae. P. 3-93 in R. A. Paynter, Jr., ed., Check-list of birds of the world, Vol. 14. Harvard Univ. Press, Cambridge, Mass.
- Mayfield, H. 1960. The Kirtland's Warbler. Cranbrook Inst. Sci., Bloomfield Hills, Michigan. 242 p.
- _____. 1972. Winter habitat of Kirtland's Warbler. Wilson Bull. 84:347-349.
- Mayr, E. 1953. Additional notes on the birds of Bimini, Bahamas. Auk 70:499-501.
- Miller, J. R. 1978. Notes on birds of San Salvador Island (Watlings), the Bahamas. Auk 95:281-287.
- Moore, N. B. 1877. List of birds, chiefly visitors from N. America, seen and killed in the Bahamas in July, Aug., Oct., Nov., and Dec., 1876. Proc. Boston Soc. Nat. Hist. 19:241-243.
- Nolan, V., Jr. 1978. The ecology and behavior of the Prairie Warbler Dendroica discolor. Ornithol. Monogr. 26:1-595.
- Northrop, J. I. 1891. The birds of Andros Island, Bahamas. Auk 8:64-80.

- Norton, R. L. 1982a. The autumn migration: West Indies region. Amer. Birds 36:223-224.
- _____. 1982b. The spring migration: West Indies region. Amer. Birds 36:897-898.
- _____. 1983. The winter season: West Indies region. Amer. Birds 37:342-344.
- _____. 1984a. The winter season: West Indies region. Amer. Birds 38:361-362.
- _____. 1984b. The spring migration: West Indies region. Amer. Birds 38:968-970.
- _____. 1985. The winter season: West Indies region. Amer. Birds 39:353-354.
- _____. 1986a. The winter season: West Indies region. Amer. Birds 40:338-339.
- _____. 1986b. The spring migration: West Indies region. Amer. Birds 40:528-529.
- _____. 1987a. The autumn migration: West Indies region. Amer. Birds 41:151-152.
- _____. 1987b. The spring migration: West Indies region. Amer. Birds 41:493-494.
- _____. 1987c. The nesting season: West Indies region. Amer. Birds 41:1491-1492.
- _____. 1988a. The autumn migration: West Indies region. Amer. Birds 42:142-144.
- _____. 1988b. The winter season: West Indies region. Amer. Birds 42:327-328.

- Paulson, D. R. 1966. New records of birds from the Bahama Islands. *Notulae Naturae* 394:1-15.
- Peters, J. L. 1927. A revision of the Golden Warbler, *Dendroica petechia* (Linne). *Proc. Biol. Soc. Washington* 40:31-41.
- Phillips, A. R. 1962. Notas sistematicas sobre aves mexicanas. I. *Anales Inst. Biol. Univ. Mexico* 32:333-381.
- Probst, J. R. 1986. A review of factors limiting the Kirtland's Warbler on its breeding grounds. *Amer. Midl. Nat.* 116:87-100.
- Radabaugh, B. E. 1974. Kirtland's Warbler and its Bahama wintering grounds. *Wilson Bull.* 86:374-383.
- Ridgway, R. 1891. List of birds collected on the Bahama Islands by the naturalists of the Fish Commission steamer Albatross. *Auk* 8:333-339.
- _____. 1902. The birds of North and Middle America. Part II. *Bull. U.S. Nat. Mus.* 50:1-834.
- Riley, J. H. 1905a. Birds of the Bahama Islands. P. 345-368 in G. B. Shattuck, ed., *The Bahama Islands*. Johns Hopkins Press, Baltimore.
- _____. 1905b. List of birds collected or observed during the Bahama expedition of the Geographic Society of Baltimore. *Auk* 22:349-360.
- Schwartz, A. 1970. Subspecific variation in two species of Antillean birds. *Quart. J. Florida Acad. Sci.* 33:221-236.

- _____ and R. F. Klinikowski. 1963. Observations on West Indian birds. Proc. Acad. Nat. Sci. Phila. 115:53-77.
- Stewart, P. A. and H. A. Connor. 1980. Fixation of wintering Palm Warblers to a specific site. J. Field Ornithol. 51:365-367.
- Todd, W. E. C. 1909. A new warbler from the Bahama Islands. Proc. Biol. Soc. Washington 22:171-172.
- _____. 1911. The Bahaman species of Geothlypis. Auk 28:237-253.
- _____ and W. W. Worthington. 1911. A contribution to the ornithology of the Bahama Islands. Ann. Carnegie Mus. 7:388-464.
- Twomey, A. C. 1936. Climographic studies of certain introduced and migratory birds. Ecology 17:122-132.
- Van Tyne, J. 1951. The distribution of the Kirtland Warbler (Dendroica kirtlandii). Proc. X Internat. Ornithol. Congress:537-544.
- _____ and H. Mayfield. 1952. Bird records from New Providence and Eleuthera Islands, Bahamas. Occ. Pap. Mus. Zool., Univ. Michigan No. 578. 4 p.
- Vaurie, C. 1953. Observations and new records of birds from the Biminis, northwestern Bahamas. Auk 70:38-48.
- Walkinshaw, L. H. and C. M. Walkinshaw. 1961. Mist-netting birds on Andros Island, Bahamas. Bird-Banding 32:46-51.
- Wetmore, A. 1932. Birds collected in Cuba and Haiti by the Parish-Smithsonian Expedition of 1930. Proc. U.S. Nat. Mus. 81:1-40.

WARBLERS OF THE WEST INDIES

V. BERMUDA

This is the fifth in a series of articles that document the distribution and biology of wood-warblers (Emberizidae: Parulinae) in the West Indies. Bermuda consists of a series of islands covering about 52 km² at 32° 15' N and 64° 51' W lying about 800 mi SE of New York City and 750 mi NE of the Turks and Caicos Islands. Bermuda is included in this series of papers even though it is not, strictly speaking, part of the West Indies. This is necessary in order to construct a complete picture of the movement of migrating warblers through the region. Indeed, the presence of large numbers of warblers on Bermuda has stimulated research and controversy on fundamental questions of migration routes.

Although various naturalists had published notes during their visits to Bermuda concerning the birds they had encountered, the checklist by Wingate (1959) was the first indication that significant numbers of individuals of many migratory warbler species were found regularly on these remote islands (status in the species accounts below follows the updated checklist published by Wingate in 1973). Drury and Keith (1962) used (and repeated much of the data from) Wingate's 1959 checklist and relative abundance figures when they considered Bermuda in their radar study of songbird migration in coastal New England. They observed birds leaving the coast after cold fronts from early Sept. to mid-

Oct. and felt that many of these birds were northern-breeding wood warblers that regularly fly across the western Atlantic from New England and the Maritime Provinces to their wintering grounds in the Antilles and South America. Part of their evidence was that those species noted regularly by Wingate on Bermuda in fall are just those that would be expected to show such a movement pattern. They reasoned that if warblers arrived in Bermuda entirely because of drift, other species that are also common in North America but that winter in Middle America would be expected to also be common on Bermuda in fall. Nisbet et al. (1963), in a more detailed consideration of this pattern that concentrated entirely upon the Blackpoll Warbler (Dendroica striata), concluded that this species is physically capable of taking such an overwater migratory route. Murray (1965) reconsidered the data in these two papers and concluded that Blackpoll and other warblers actually reach Bermuda accidentally as a result of wind drift. He countered the conclusion of Drury and Keith (1962) concerning the absence of western-wintering warblers on Bermuda with data that indicate that these same birds are rare at netting stations in the fall along the Atlantic coast of the United States and would thus not be as susceptible to wind-drift over the ocean. He wrote "in fact, then, the common species along the Atlantic coast are common at Bermuda, and the relatively rarer species rare at Bermuda" and that "the relative abundance of the species of

warblers at Bermuda is exactly what one would expect if a nonselective sample of the coastal migrants had been wind-drifted over the ocean." Nisbet (1970) countered this with convincing evidence that Blackpolls migrate directly over the western Atlantic and should be expected on Bermuda during normal migration (see more discussion below under that species).

This manuscript, as prior papers in this series, is based on specimens housed in 37 museum collections and on published information. Unfortunately, I have been unable to locate at least 50 specimens of 21 species referred to in the literature. Approximately 22 of these were reported by Reid (1884) from the Bartram collection on Bermuda. Over the years, this collection has deteriorated to the point that only a very few specimens exist, none of them warblers (D. Wingate, pers. comm.).

Results of the 12 Christmas Bird Counts (CBC's) held on Bermuda are included. As the number of party-hours per count has been rather consistent (mean = 30.1, ranging from 20 to 39.5), raw numbers of individuals are reported for the 28 warbler species recorded on these counts.

Names of museums are abbreviated after first mention, as are the words specimen[s] (spec.[s]) and individual[s] (ind.[s]).

SPECIES ACCOUNTS

Vermivora pinus - Blue-winged Warbler. Listed by Wingate (1973) as occurring regularly in fall migration and sporadically into winter. CBC's: 1979 (1 ind.), 1984 (2), and 1985 (1).

Vermivora chrysoptera - Golden-winged Warbler. Listed by Wingate (1973) as occurring rarely in early fall migration and even less frequently in spring.

Vermivora peregrina - Tennessee Warbler. 4 specs.: 2 from 26 Sept. 1957 (American Museum of Natural History [AMNH]) and 1 each on 22 Oct. 1964 (Bermuda Aquarium, Museum and Zoo [BAMZ]) and 11 Jan. 1954 (loc.?). Sighting, of 1 ind. from 2 March 1914 for over 6 weeks thereafter (Bradlee et al. 1931, Bent 1953). Wingate (1973) indicated that they are irregular but sometimes common in autumn migration and very sporadic through winter and spring migration. CBC's: 1976, 1978, 1981 (1 ind. each year).

Vermivora celata - Orange-crowned Warbler. 1 spec.: 15 Oct. 1958 (AMNH). Listed by Wingate (1973) as occurring infrequently from autumn migration through winter and spring. CBC's: 1979 (1 ind.), 1982 (2), 1986 (1).

Vermivora ruficapilla - Nashville Warbler. 2 specs.: 6 Oct. 1957 (AMNH) and 19 Oct. 1970 (BAMZ). Another spec. reported, 16 Sept. 1907 (Bradlee et al. 1931). Wingate (1973) indicated that there were regular autumn reports and a few in winter and early spring. CBC: 1985 (2 inds.).

Parula americana - Northern Parula. 4 specs.: 1 each from unspecified dates in 1848 (Academy of Natural Science of Philadelphia [ANSP]; this may be the spec. collected on 21 April 1849 by Tristram and referred to by Wedderburn 1859, Martens 1859, and Reid 1884) and in Oct. 1874 (British Museum [Natural History] [BMNH]; surely the spec. that Reid 1884 collected on 19 Oct. 1874), 1 ind. on 18 April 1913 (BMNH; Kennedy 1914, Bradlee et al. 1931), and 1 from an unspecified date in 1968 (a skeleton in the Peabody Museum, Yale University [PM]). Hurdiss (1859) found an undated spec. among a collection of skins sent him for inspection (also in Reid 1884). Bartram collected a spec. on 26 March 1878 (Reid 1884). Sighting, 14 Oct. 1929 (Bradlee et al. 1931). Listed by Bland (1859), Ridgway (1902), and the American Ornithologists' Union (1983). Wingate (1973) considered it fairly common in Oct. and then uncommon until late April. CBC's: noted in all counts (mean = 7.2 inds./count).

Dendroica petechia - Yellow Warbler. 5 specs.: 30 and 31 Aug. 1963 and 29 Sept. 1962 (all AMNH), 27 Sept. 1967 and 9 Oct. 1964 (both BAMZ). 5 others reported (none located):

Reid (1884) noted 2 collected by Denison on 23 Nov. 1875 and 2 others in Bartram's collection; Bradlee et al. 1931 noted these in addition to a spec. that flew into a light on 14 Oct. 1903 (Bent 1953 referred to the Nov. and Oct. dates). Wingate (1973) listed them as regular early in fall and very rare thereafter. CBC: 1977 (1 ind.).

Dendroica pensylvanica - Chestnut-sided Warbler. 1 spec., 5 Oct. 1967 (BAMZ). Sighting, 12-15 March 1901 (Verrill 1901, Cooke 1904). Wingate (1973) noted the regular occurrence of a few inds. during autumn migration and one report in spring.

Dendroica magnolia - Magnolia Warbler. 1 spec.: Sept. 1963 (AMNH). Another reported, 7 May 1878 (Reid 1884 quoted Bartram on this; also in Bradlee et al. 1931 and Bent 1953). They occur regularly in autumn migration and then sporadically through winter and spring migration (Wingate 1973). CBC's: noted in 8/12 counts held (total number of inds. = 19).

Dendroica tigrina - Cape May Warbler. 2 specs.: 2 Dec. 1975 and 9 March 1968 (both BAMZ). 1 additional spec. reported, 3 April 1909 (not located; Bradlee et al. 1931). Wingate (1973) indicated that it was fairly common in fall migration dwindling to uncommon in winter and scarce in spring. CBC's: noted in all counts (mean = 9.4 inds./count).

Dendroica caerulescens - Black-throated Blue Warbler. 2 specs.: 30 Jan. and 28 Oct. 1958 (AMNH). Reid (1884) noted 2 specs. in Bartram's collection and Bradlee et al. (1931) reported another from 2 Oct. 1902 (none located; Bent 1953 made note of the latter date). Wingate (1973) considered it uncommon in autumn migration and rare through winter and spring. CBC's: noted in 9/12 counts (total number of inds. = 14).

Dendroica coronata - Yellow-rumped Warbler. 5 specs.: 9 Oct. 1967 and 16 Nov. 1966 (both BAMZ), 4 Nov., 17 Dec., and a third from an unspecified date, all in 1874 (BMNH; these are among the few specs. remaining from those listed by Reid [1884], who considered this the commonest species in Nov. and Dec. 1874). In addition, Wedderburn (1859) reported 3 specs., including one collected 24 Jan. 1850; Hurdis (1859) noted 4 specs., including several collected from a flock of more than 100 birds and another from 5 April 1855. Reid (1884) noted that, in addition to his own specs., there were 4 in the Bartram collection (whether these were among those noted by Wedderburn or Hurdis is unclear). An ind. identified as D. c. auduboni was observed from 12-16 April 1976 (Wingate, pers. comm.). Bradlee et al. (1931) indicated that 2 inds. were observed on 18 Oct. 1930. Listed by Bland (1859) and Martens (1859); Wingate (1973) considered them abundant in late Oct. and early Nov., common

during the winter, and regular through spring migration. The most common warbler species in CBC's (mean = 53.8 inds./count); extremely variable from year to year, however (range - 4-223).

Dendroica townsendi - 1 spec., 26 Sept. 1975 (BAMZ).

Sightings: 25 Sept. 1975, 3 Oct. 1986, 9 Oct. 1979, and 2-28 Dec. 1975 (Wingate, pers. comm.). CBC: 1975 (1 ind.).

Dendroica virens - Black-throated Green Warbler. 1 spec., 26 Sept. 1975 (BAMZ). Reid (1884) noted 3 (perhaps 4) specs. in Bartram's collection, including one collected 7 May 1878 (none located). Sightings: Feb. 1927 and 1 May 1928 (Bradlee et al. 1931). Bent (1953) repeated these reports and Wingate (1973) noted the species as regular in autumn migration and occasional in winter and spring migration. CBC's: in all counts, but in low numbers (mean = 2.4 inds./count).

Dendroica fusca - Blackburnian Warbler. 1 spec.: 15 Sept. 1963 (AMNH). Sighting, 12-15 March 1901 (Verrill 1901). Wingate (1973) considered them regular but scarce in fall migration; there is a single spring report.

Dendroica dominica - Yellow-throated Warbler. 2 specs.: 7 Oct. 1962 and 17 Sept. 1963 (both AMNH). Small numbers occur from early fall all the way through spring migration (Wingate 1973). CBC's: in 6/12 counts (1 ind. each time).

Dendroica pinus - Pine Warbler. 1 spec.: 7 Nov. 1958 (AMNH). Wedderburn (1859) noticed a good many from 27 Sept. through early Oct 1849. Hurdis (1859) captured many on 5 Oct. 1850 and noted a flock coming in from sea on 15 Oct. of that year. Martens (1859) repeated these observations; Reid (1884) did so as well and added that Bartram had a 16 March 1875 spec. and had kept a bird alive from its capture in Oct. 1887 at least until the following Feb. Bradlee et al. (1931) observed numerous inds. in Oct. 1929 and on 4 Oct. 1930 and commented that "Mr. Mowbray reports them as the most common warbler found visiting Bermuda." Listed by Bland (1859). Wingate (1973) considered this species very rare from Oct. to Feb. CBC's: 1982 (1 ind.), 1985 (2), 1986 (3). The specimen and recent reports confirm that Pine Warblers, presumably D. p. pinus from North America, do occasionally reach Bermuda. However, as none of the 19th century authors note the presence of Dendroica striata, a bird that reaches Bermuda in numbers at the very time that the alleged Pine Warblers arrived, and also a bird that in fall plumage looks very similar to young Pine Warblers, I must conclude that these references (save for perhaps Bartram's March spec.) as well as those above of Bradlee et

al. (1931) pertain to Blackpoll Warblers. Nisbet (1970) indicated, without specifying when it occurred, that "there appears formerly to have been confusion between the Blackpoll and the Pine Warbler" on Bermuda.

Dendroica discolor - Prairie Warbler. 1 spec.: 11 Sept. 1963 (AMNH). Another spec. reported, 3 Oct. 1848 (collection noted by Wedderburn 1859 and then subsequently by Bland 1859, Martens 1859, Reid 1884, Ridgway 1902, Bradlee et al. 1931, and Bent 1953). Wingate (1973) considered them scarce to uncommon from early fall through spring migration. CBC's: in 8/12 counts held (total number of inds. = 15).

Dendroica palmarum - Palm Warbler. 3 specs.: 6 Jan. and 16 Nov. 1958 and 27 Dec. 1963 (all AMNH). Additional specs., 17 Dec. 1847 and 3 Dec. 1848 (Wedderburn 1859, Martens 1859, Reid 1884) and 2 in Bartram's collection (Reid 1884). Bradlee et al. (1931) noted 2 specs. from 4 Sept. 1899 and 1 each on 3 Oct. 1902 and 14 Nov. 1903. Sighting, 15 March 1937 (Griscom 1937; Beebe 1937 called this a first island record). Bent (1953) listed many of these dates and indicated incorrectly that the 1937 date represented a spec. Listed by Bland (1859), Hellmayr (1935), and the American Ornithologists' Union (1983). Wingate (1973) considered D. p. palmarum abundant in Oct. and common until April; he also noted the irregular occurrence of D. p. hypochrysea over the

same time period. CBC's: in all counts (mean = 24.8 inds./count; 3rd highest warbler total).

Dendroica castanea - Bay-breasted Warbler. 1 spec.: 2 Oct. 1957 (AMNH). 1 ind. reported in the Bartram collection (Reid 1884; also in Bradlee et al. 1931 and Bent 1953). There are regular records in autumn migration and one spring report (Wingate 1973).

Dendroica striata - Blackpoll Warbler. 6 specs.: 11 Oct. 1929, 28 Oct. 1951, an unspecified date in Oct. 1954, and 26 Sept. 1962 (all AMNH), and 2 from 28, 30 Oct. 1952 (loc.?). Early authors made reference to large numbers of Pine Warblers arriving in the fall, but did list the Blackpoll Warbler. This, I feel, was due to a series of misidentifications; as indicated above, many of the notes in the Pine Warbler section undoubtedly belong here. On the other hand, there was a bird observed between 12-15 March 1901 identified as a Blackpoll (Verrill 1901, Bradlee et al. 1931); because this would be the only spring Blackpoll record, the possibility of misidentification of a Pine Warbler cannot be disregarded. Bradlee et al. (1931) reported that Beebe had observed 6 inds. on 12 Oct. and one on 21 Oct. 1929 (also in Bent 1953). Wingate (1973) listed them as extremely rare in spring, but abundant during fall migration. Drury and Keith (1962) used Wingate's abundance data as part of their evidence for the regular overwinter

fall migration of this as well as other warbler species that nest in northern North America and winter in the Antilles or South America (see introduction for the general aspects of this and the following references). Nisbet et al. (1963) concentrated their attention on the Blackpoll Warbler as a component of this phenomenon. They captured fall birds in Massachusetts to evaluate fat reserves and observed departure from New England via radar while simultaneously watching for and weighing birds on Bermuda. They set out mist-nets in Bermuda beginning in mid-Sept. 1962 but only captured 2 inds. before 3 Oct. (26 Sept. and 2 Oct.). From then until 28 Oct., they captured 139 birds. The first heavy influx occurred during the night of 3 Oct. during a rainshower when at least 50 birds (14 of which were captured) were attracted to a lighthouse. These birds were thought to have been part of a large flight detected departing from New England about 32 hours earlier, a time period during which birds flying at the speed at which they are presumed to fly would be expected to cover the intervening 720-820 miles. Nisbet et al. also reasoned that, were it not for the rainstorm and the attraction of the lighthouse, these birds would not have stopped at Bermuda at all, and they indeed retained the fat reserves that would have enabled them to fly non-stop to at least the Lesser Antilles and perhaps to Venezuela. The 125 birds netted on Bermuda on dates after 3 Oct., however, did not fit so neat a pattern. Their arrival could not be

correlated with a departure from New England, nor did their weights consistently seem sufficient to allow them to continue flying beyond Bermuda to the next landfall.

Murray (1965) felt that Blackpolls arriving on Bermuda are vagrants "wind-drifted" from the mainland by northwesterly or westerly winds. He reported that all of the dates of arrival of birds on Bermuda in Nisbet et al. (1963) could be correlated with periods of persistent westerly winds off the eastern coast of the United States. He also wondered that if the birds normally pass over Bermuda on their normal route south unless distracted by rain and lights, why the great majority of the birds netted by Nisbet et al. occurred on rainless days (Murray included Bermuda precipitation data to show this). Murray concluded that Blackpolls in the northeastern United States typically fly southwestward to the southeastern United States before turning southeastward toward South America and that some accidentally reach Bermuda as a result of being blown off course.

Wingate and Baird (1965) reported that an immature Blackpoll banded on Bermuda on 11 Oct. 1962 was subsequently shot during Nov. 1963 in North Carolina. This, they wrote, "offers tangible proof that Blackpolls can complete their migration successfully following a landing on Bermuda, regardless of the circumstances which bring them there initially."

Nisbet (1970) analyzed fall occurrences of Blackpolls throughout eastern North America and concluded that most birds concentrate in the northeast in late Sept. and then leave the North American continent without another stop. His conclusions are based in part on the bird's rarity in the southeastern United States. Dates of arrival in the West Indies and South America are earlier than dates in Florida; furthermore, those dates on which birds do arrive in Florida coincide exactly with storms blowing in from the Atlantic. It appears unlikely that the route described as typical by Murray is correct. Nisbet included a map on which Bermuda lies directly in a line beginning with the radar-tracked orientation of birds (presumably largely, or including, this species) leaving New England and the Blackpoll wintering range in northern South America.

Dendroica cerulea - Cerulean Warbler. 1 spec.: 1 Oct. 1962 (AMNH). Wingate (1973) noted a few early autumn reports.

Mniotilta varia - Black-and-white Warbler. 7 specs.: 10 March and 23 April 1913 (BMNH; Kennedy 1914), 28 Sept. 1960 (United States National Museum [USNM]), 22 Oct. 1962, and an unspecified date in Oct. 1963 (both AMNH), 26 Dec. 1966 and 23 Dec. 1973 (both BAMZ). Additional specs.: Oct. 1849 (Wedderburn 1859), 27 Oct. 1852 (Hurdis 1859; Martens 1859 and Reid 1884 noted these last 2 specs.), Jan. 1871, 4 May 1878 (Bartram collection) (Reid 1884 noted these last 2, and

also commented that he "found them quite common in the autumn of 1874 and winter succeeding it, and obtained several specimens"), and 10 April 1909 (Bradlee et al. 1931 noted this and observed that numbers of this species appear every autumn and quite a few remain all winter). Sighting, 4 Oct. 1935 (Beebe 1937). Bent (1953) commented that this species has been reported in 6 different years from Oct. to May. Listed by Bland (1859), Ridgway (1902), and Hellmayr (1935). Wingate (1973) listed it as common during autumn migration and then scarce through winter and spring migration. CBC's: in all counts (mean = 13.5 inds./count; 7th most frequently reported warbler).

Setophaga ruticilla - American Redstart. 3 specs.: ? Oct. 1966, 6 Oct. 1967, and 1 July 1971 (all BAMZ). Reid (1884) noted 2 specs. in Mr. Bartram's collection (not located). Listed by Bradlee et al. (1931) and the American Ornithologists' Union (1983). Wingate (1973) indicated that they are quite common for a few weeks in fall, and then fairly common through winter and spring migration. CBC's: in all counts (mean = 27.3 inds./count; 2nd most common warbler).

Protonotaria citrea - Prothonotary Warbler. 2 specs.: 28 Aug. 1958 (AMNH) and a mummified spec. found in 1963 (BAMZ). 2 other specs. reported (both in Bent 1953): one in Bartram's collection from autumn 1874 (Reid 1884) and the

other from Nov. 1903 (Bradlee et al. 1931). Wingate (1973) noted regular occurrences early in fall migration and rare appearances in spring. CBC: 1982 (1 ind.).

Helmitheros vermivorus - Worm-eating Warbler. 1 spec., 4 Oct. 1899 (not located; Bradlee et al. 1931, Bent 1953). Listed as casual by the American Ornithologists' Union (1983) and as occurring regularly but in low numbers from early fall through the spring migration by Wingate (1973). CBC's: in 10/12 held (total number of inds. = 29).

Limnothlypis swainsonii - Swainson's Warbler. 1 spec.: 6 Feb. 1959 (AMNH). Listed as infrequent in autumn migration and winter by Wingate (1973). CBC's: 1975 (1 ind.) and 1981 (1).

Seiurus aurocapillus - Ovenbird. 6 specs.: 12 Dec. 1874 (BMNH; Reid 1884), 27 Nov. 1957 and 17 Nov. 1963 (both AMNH), ? Oct. 1964, 8 Nov. 1969, and 12 Dec. 1965 (BAMZ). In addition to the 1874 spec. above, Reid (1884) collected birds on 24 Oct. and 16 Dec. and wrote that "the species was numerous in the autumn of 1874;" he also referred to 3 other specs., one from autumn 1873 and 2 others, collected earlier, in Bartram's collection (none located; information also in Bradlee et al. 1931). Listed by Salvin and Godman (1881), Sharpe (1885), and the American Ornithologists' Union (1983). Wingate (1973) considered them fairly common

in autumn migration and uncommon in winter and spring migration. CBC's: in all counts (mean = 18.9 inds./count; 6th most common warbler).

Seiurus noveboracensis - Northern Waterthrush. 7 specs.: one each from an unspecified date in 1840 (ANSP), 7 Nov. and 12 Dec. 1874 (both BMNH), 11 Aug. 1960, 20 Aug. 1956, ? Sept. 1952, and 14 Sept. 1963 (all loc.?). Surprisingly, the early specs. do not appear to be mentioned in the literature. Wedderburn (1859) felt the birds arrived regularly in autumn and that a few remained all winter; he acquired "several specimens" but probably none as early as 1840. Reid (1884) commented that although they appear regularly in early Oct., they are common in mangroves in Oct. and Nov. and a few remain all winter; he was not aware of any specs. Bradlee et al. (1931) noted one spec. each from Nov. 1909 and 12 Feb. 1931 (not located) and commented that the species is seen every winter in mangroves. Listed by Bland (1859), Martens (1859), Ridgway (1902), Bent (1953), and the American Ornithologists' Union (1983). Wingate (1973) listed them as common from early fall through the autumn and then fairly common in winter and spring. CBC's: in all counts (mean = 20.9 inds./count; the 4th most common warbler).

Seiurus motacilla - Louisiana Waterthrush. 1 spec.: 20 Aug. 1956 (AMNH). Bradlee et al. (1931) noted 4 other specs. (none located) from 4 Sept. 1899 (listed as an early fall date by Bent 1953), 10 and 15 Dec. 1908, and in Jan. 1930. They are scarce in Aug. and Sept. and there is one spring report (Wingate 1973).

Oporornis formosus - Kentucky Warbler. 1 spec., Aug. or Sept. 1974 (BAMZ). Wingate (1973) indicated that a few were seen regularly in fall migration and also noted a single spring report. CBC: 1983 (1 ind.).

Oporornis agilis - Connecticut Warbler. 5 specs.: 6 Oct. 1957 and 1 Oct. 1958 (both AMNH), and ? Oct. 1972 and 5 and 7 Oct. 1967 (all BAMZ). Wingate (1973) denoted them rare in late Sept. and early Oct.

Oporornis philadelphia - Mourning Warbler. 2 specs.: 6 Sept. 1957 (loc.?) and 2 Oct. 1961 (AMNH). Wingate (1973) indicated that they occur rarely for a few weeks during autumn migration.

Geothlypis trichas - Common Yellowthroat. 1 spec.: 30 Oct. 1963 (AMNH). Wedderburn (1859) and Reid (1884) noted a spec. collected 18 Oct. 1853 (Martens 1859 dated this 18 Oct. 1849). Reid (1884) also found one in Bartram's collection (perhaps the same ind.). Bradlee et al. (1971)

indicated that several had been collected in Sept. and Oct. and that an April 1850 sighting was the only spring report. Sighting, 25 April 1937 (in mangroves, Beebe 1937). A pair of adult males was observed aboard a ship 120 miles from Bermuda (at 29°49' N, 66°54' W) on 25 Oct. (Newton 1954). Wingate (1973) listed them as fairly common from autumn migration through winter and spring migration. CBC's: in all counts (mean = 19.5 inds./count; 5th most common warbler).

Wilsonia citrina - Hooded Warbler. 3 specs.: 27 Aug. 1975 and 19 Sept. 1966 (both BAMZ) and 28 Sept. 1957 (AMNH). Another spec. reported, 30 March 1847 (and another observed on that date) (Hurdis 1859, Wedderburn 1859, Martens 1859, Reid 1884, Bradlee et al. 1931). Listed by Bland (1859), Sharpe (1885), and Ridgway (1902); Wingate (1973) noted that they are fairly common in fall migration and scarce through winter and spring migration. CBC's: in 11 of 12 held (total number of inds. = 30).

Wilsonia pusilla - Wilson's Warbler. Wingate (1973) indicated that a few occur during autumn migration. CBC: 1977 (1 ind.).

Wilsonia canadensis - Canada Warbler. Wingate (1973) indicated that there were a few early fall reports.

Icteria virens - Yellow-breasted Chat. 1 spec.: 14 Nov. 1957 (AMNH). Wingate (1973) noted that they are rare from Sept. to March. CBC: 1976 (1 ind.).

DISCUSSION

Thirty-eight species of warblers have been reported from Bermuda. Specimens of 34 of these have been located. I have located a smaller percentage of specimens reported in the literature from here than from other areas that I have surveyed. Many of these unlocated specimens, I believe, no longer exist.

The importance of Bermuda in warbler migration remains a question. The series of papers beginning with Drury and Keith (1962) was concluded by Nisbet's (1970) convincing argument that Blackpoll Warblers fly over Bermuda in their regular fall migration and that their abundance for brief periods on Bermuda indicates that many stop over. Even if they become locally dense, it would be surprising if those landing constituted more than a very small percentage of the total population of Blackpoll Warblers. Without more data, it would be frivolous to speculate whether or not this species or populations within it absolutely require suitable terrestrial habitat on Bermuda as a stopover.

The most recent suggestion concerning other warbler species was the intimation of Murray (1965) that they are blown out to sea from the east coast of North America and

that some individuals are fortunate enough to be blown to Bermuda rather than to the vast mid-Atlantic Ocean. This may very well be the case for many species for which there are a very few or sporadic records. However, it is difficult to believe that those species that overwinter every year in large numbers fall into this category.

CBC data (from Pashley and Martin 1988) are of interest here. On the basis of number on individuals reported per party-hour averaged over all CBC's held, there are more Yellow-rumped Warblers, American Redstarts, and Ovenbirds on Bermuda than in any other count circle in the West Indies. In addition, the numbers per party-hour of Cape May Warbler, Palm Warbler, Black-and-white Warbler, and Common Yellowthroat are higher than the overall average for West Indies counts. The Northern Parula and Northern Waterthrush are below the regional average but are still more common than in any mainland Neotropical count circle. When the count as a whole is considered, there are more warbler species per count on Bermuda (15.9) than in any other count in the West Indies, and the standard error around that mean is less than for any other count area. Although significant cautions need to be taken in interpretation of CBC data, the consistency of these results warrants their consideration.

Of course, the land mass of Bermuda is miniscule, and all species found there commonly winter in many other places. It is not necessary to consider Bermuda as critical habitat for any of these species. On the other hand,

considering the occurrence of these common species to be accidental does not seem justified. If there are subsets of these species that regularly migrate to and from Bermuda, fascinating questions arise as to the evolution or development and continued maintenance of this behavior.

LITERATURE CITED

- American Ornithologists' Union. 1983. Check-list of North American birds. 6th ed. American Ornithologists' Union, Washington, D. C. 877 p.
- Beebe, W. 1937. Recent notes on Bermuda birds. Proc. Linnaean Soc. New York 48:60-65.
- Bent, A. C. 1953. Life histories of North American wood warblers. Bull. U. S. Nat. Mus. 203:1-734.
- Bland, R. E. 1859. List of birds of Bermuda. Annual Report Smithsonian. Inst. for 1858:286-289.
- Bradlee, T. S., L. L. Mowbray, and W. F. Eaton. 1931. A list of birds recorded from the Bermudas. Proc. Boston Soc. Nat. Hist. 39:279-382.
- Cooke, W. W. 1904. Distribution and migration of North American warblers. U.S.D.A. Div. Biol. Surv. Bull. 18. U. S. Dept. Agric., Washington, D. C. 142 p.
- Drury, W. H. and J. A. Keith. 1962. Radar studies of songbird migration in coastal New England. Ibis 104:449-489.
- Griscom, L. 1937. Palm Warbler in Bermuda. Auk 54:543-544.

- Hellmayr, C. E. 1935. Catalogue of birds of the Americas and adjacent islands. Field Mus. Nat. Hist., Zool. Ser. 13: Part 8:1-541.
- Hurdis, J. L. 1859. Further notes and observations on the resident and migratory birds of the Bermudas. P. 56-97 in Jones, J. M., The naturalist in Bermuda: a sketch of the geology, zoology, and botany, of that remarkable group of islands; together with meteorological observations. Reeves & Turner, London.
- Kennedy, J. N. 1914. Notes on birds observed in the Bermuda Islands during the winter of 1912-1913. Ibis 56:185-191.
- Martens, E. von. 1859. Die Vogel der Bermuda-Inseln, nach Wedderburn und Hurdis. J. f. Ornithologie 7:211-226.
- Murray, B. G., Jr. 1965. On the autumn migration of the Blackpoll Warbler. Wilson Bull. 77:122-133.
- Newton, R. 1954. American land-birds and other species seen in the North Atlantic. Ibis 96:484.
- Nisbet, I. C. T. 1970. Autumn migration of the Blackpoll Warbler: evidence for long flight provided by regional survey. Bird-Banding 41:207-240.
- _____, W. H. Drury, Jr., and J. Baird. 1963. Weight-loss during migration. Part 1. Deposition and consumption of fat by the Blackpoll Warbler Dendroica striata. Bird-Banding 34:107-138.
- Pashley, D. N. and R. P. Martin. 1988. The contribution of Christmas Bird Counts to knowledge of the winter

- distribution of migratory warblers in the Neotropics.
Amer. Birds 42:1164-1176.
- Reid, S. G. 1884. Natural history of the Bermudas. Part
IV. - Birds. Bull. U. S. Nat. Mus. 25:163-279.
- Ridgway, R. 1902. The birds of North and Middle America.
Part II. Bull. U. S. Nat. Mus. 50:1-834.
- Salvin, O. and F. D. Godman. 1881. Biologia Centrali-
Americana. Aves. Vol. I. Taylor and Francis, London.
512 p.
- Sharpe, R. B. 1885. Catalogue of birds in the British
Museum. Vol. 10. The British Museum, London. 682 p.
- Verrill, A. H. 1901. Notes on the birds of the Bermudas
with descriptions of two new subspecies and several
additions to the fauna. Osprey 5:83-85.
- Wedderburn, J. W. 1859. Notes and observations on the
resident and migratory birds of the Bermudas. P. 23-56
in Jones, J. M., The naturalist in Bermuda: a sketch of
the geology, zoology, and botany, of that remarkable
group of islands; together with meteorological
observations. Reeves & Turner, London.
- Wingate, D. B. 1959. A checklist of the birds, mammals,
reptiles, and amphibians of Bermuda. Bermuda Audubon
Soc., Hamilton. 33 p.
- _____. 1973. A checklist and guide to the birds of
Bermuda. Publ. by the author, Bermuda. 35 p.

_____ and J. Baird. 1965. Blackpoll Warbler banded in
Bermuda recovered in North Carolina. Bird-Banding
36:192.

WARBLERS OF THE WEST INDIES

VI. PUERTO RICO AND ADJACENT ISLANDS

This is the sixth in a series of papers that summarize the distribution and biology of wood-warblers (Emberizidae: Parulinae) in the West Indies. It covers not only Puerto Rico but also nearby islands from Mona on the west to Culebra and Vieques on the east. As in previous papers in this series, data sources have been the specimens housed in 37 museum collections and the published literature.

Because of the large numbers of specimens from Puerto Rico, a tabular format has been adopted for each species for which I have located more than five specimens from that island. They are sequenced by month and then day of the month. Unless otherwise indicated in the numbers column, each date is represented by one specimen. As the predominance of blanks in the reference column indicates, most specimens have not been reported in the literature. The following museums are mentioned in the text.

AMNH - American Museum of Natural History
ANSP - Academy of Natural Science of Philadelphia
BMNH - British Museum (Natural History)
CM - Carnegie Museum of Natural History
COR - Cornell University
DENV - Denver County Natural History Museum
DNHM - Delaware Natural History Museum
FM - Field Museum of Natural History

LACM - Los Angeles County Museum of Natural History
LSU - Louisiana State University Museum of Zoology
MCZ - Museum of Comparative Zoology, Harvard
MVZ - Museum of Vertebrate Zoology, Berkeley
ROM - Royal Ontario Museum
SWK - Southwestern College (Kansas)
UMMZ - University of Michigan Museum of Zoology
UPRM - University of Puerto Rico, Mayaguez
USNM - United States National Museum
ZMA - Zoologisch Museum, Amsterdam

McCandless (1962) reported the results of 11 Christmas counts conducted independently and sporadically in southwestern Puerto Rico in the 1920's and 1950's. Three count circles have been sites of Christmas Bird Counts (CBC's) published in American Birds. There have been 15 Cabo Rojo (CR) CBC's and 6 each from Cayey (CY) and San Juan Bay (SJ). Pertinent details from all of these counts are included in the text.

SPECIES ACCOUNTS

Vermivora pinus - Blue-winged Warbler.

Puerto Rico - Abramson et al. (1974), in noting this species from Hispaniola, referred to a personal communication from Bond that there were at least 2 reports of it from Puerto Rico. I am unaware of any explicit documentation of this.

Vermivora chrysoptera - Golden-winged Warbler.

Puerto Rico - Sightings: 1 Feb. 1965 (Bond 1966, Gochfeld 1974), 3 early winter reports (Bond 1971, Gochfeld 1974), and 21 Dec. 1969 (Bond 1971, Gochfeld 1974).

Parula americana - Northern Parula.

Mona - 1 spec., 19 April 1944 (UPRM; Barnes 1946 collected this and considered it an uncommon winter migrant). Sighting, early Nov. 1960 (Rolle 1961b). Raffaele (1973) noted it as uncommon.

Puerto Rico - 114 specs.:

	day	year	mus.	nos.	ref
Oct.	21,25	1901	AMNH	2	
N=2					
Nov.	4,5	1900	AMNH	2	
	10	1926	USNM		c
	10	1942	UPRM		
	11-15	1888	FM	3	

	10-21	1987	LSU	14	
	16	1935	USNM		
	17	1942	LSU		
	17,24	1928	USNM	2	c
	22	1941	UPRM		
	30	1934	USNM	2	
N=28					
Dec.	2	1933	USNM		
	18-30	1911	USNM	6	b
	20,21	1923	COR	2	
N=9					
Jan.	3-31	1912	USNM	9	b
	10,22	1899	USNM	2	
	30	1949	UPRM		
	31	1941	UPRM		
N=13					
Feb.	2-12	1912	USNM	3	b
	2-21	1941	UPRM	4	
	4	1907	BMNH		
	5	1892	FM		
	10	1929	USNM		c
	14	1912	CM		
	20	1965	LSU		
	25	1901	AMNH		
N=13					
March	1	1900	USNM	2	
	1-26	1912	CM	10	b

2	1912	USNM	2
7	1965	LSU	
11,12	1892	FM	2
12	1941	UPRM	
29	1968	ROM	

N=19

April	1,7	1900	USNM	2	
	1-23	1912	CM	16	
	8	1900	AMNH		
	12	1971	ROM		
	15	1924	COR		
	15-18	1977	USNM	3	
	27	1961	LSU		
	30	1912	USNM		b

N=26

May	2	1912	CM		
	2	1924	COR		a

N=2

undated			BMNH	2	d
---------	--	--	------	---	---

N=2

a - Danforth 1926

b - Wetmore 1927

c - Danforth 1931

d - Sharpe 1885

Additional specs., undated (Bryant 1865, 1866).

Sightings: 1-25 June (Norton 1986), 10 June 1900 (Bowdish 1903), 10 Aug. 1921 (Struthers 1923), 19 Sept. (Bent 1953),

29 Sept. 1924 (Danforth 1926, 1931), in 10/11 Christmas counts (the most abundant warbler, McCandless 1962), 15 April (Danforth 1922), 3 May 1928 (Danforth 1931), and 7 May 1921 (Struthers 1923, Bent 1953). Many banded, but no returns or evidence of territorial behavior (Faaborg and Winters 1979, 1980, Faaborg 1982, Faaborg and Arendt 1984). Observed by Recher and Recher (1966), Leck (1972), Willis (1973), Post (1978), and Bennett (1980). Listed by Bello (1871), Gundlach (1874, 1878a, from Oct.-April, 1878b), Stahl (1882, 1887), Cory (1892), Danforth (1922, as the most abundant wintering warbler), Hellmayr (1935), McCandless (1958, as the commonest wintering warbler), Leopold (1963, also as the commonest wintering warbler), Biaggi (1970, as possibly the most abundant warbler, Aug.-May), and Raffaele (1983, as the most common wintering warbler, as early as Aug. and as late as May). It has been noted in all kinds of localities (Danforth 1922), in brushy as well as wooded regions (Danforth 1931), and from coastal thickets and scrub into mountain forests (Raffaele 1983). Wetmore (1916a) found it everywhere in forest growth, also in mango trees in pastures; Bennett (1980) observed it in mangroves. Wetmore (1916a) found 98% animal and 2% plant matter in 61 stomachs examined; Danforth (1926) reported 93% animal and 7% plant material. CBC: regular and common on all 3 counts.

Cayo Santiago - 1 spec., 21 Jan. 1959 (MVZ).

Vieques - 18 specs.: 6 from 17-23 Jan. 1900 (AMNH), 1 on 24 March 1900 (USNM; collected by Richmond according to

Wetmore 1927), 5 from 18-29 March 1912 (USNM; Wetmore 1916b, 1927 observed others up until 3 April), and 6 from 24-31 Dec. 1935 (USNM; Danforth 1937 noted 9 specs. from this period; their stomachs contained exclusively insects). Bowdish (1900, 1903) and Sorrie (1975) considered it the most abundant warbler species.

Luis Pena - Sighting, 11 April 1912 (Wetmore 1917, 1927).

Culebra - 3 specs., 9-19 April 1912 (USNM; Wetmore 1917, 1927 considered it abundant at that time).

Dendroica petechia cruciana - Yellow Warbler.

See the treatment of this subspecies in the Virgin Islands (Chapter I) for its taxonomic history. There are no reports of migrants of other subspecies.

Mona - Listed by Raffaele (1973) on the basis of an undated sighting and a bird heard singing (by Raffaele) on 2 July 1972.

Puerto Rico - 179 specs.:

	day	year	mus.	nos.	ref.
July	2	1935	USNM	4	
	8-24	1912	USNM	5	b
N=9					
Aug.	14	1892	AMNH	2	
	16	1927	ANSP		
	19-30	1912	USNM	6	b
	20	1899	AMNH		

	22-24	1962	LSU	9	
	25-27	1962	LSU	7	
	29	1962	LACM		
N=27					
Sept.	3	1928	USNM		c
	6	1901	AMNH	2	
	16	1945	LSU		
	19	1936	USNM		
	28	1899	AMNH		
N=6					
Oct.	4	1941	UPRM		
	22,23	1966	SWK	2	
	27	1928	MCZ		
	29	1987	LSU	4	
N=8					
Nov.	3	1926	USNM		c
	3-18	1987	LSU	14	
	14	1942	UPRM		
	16	1935	UMMZ		
	25	1933	USNM		
	30	1900	AMNH		
N=19					
Dec.	5	1942	LSU		
N=1					
Jan.	2	1912	USNM	5	b
	11	1943	UPRM		
	11	1961	LSU		

	31	1899	USNM	2	b
N=9					
Feb.	1	1936	USNM		
	3-15	1899	USNM	4	b
	4	1903	BMNH		
	5	1907	BMNH	2	
	5	1917	MCZ		
	7	1941	UPRM	2	
	9-19	1912	USNM	3	b
	10-22	1912	CM	3	b
	17	1900	USNM	2	b
	18	1900	AMNH		b
N=20					
March	4	1900	USNM		b
	6	1930	MCZ		
	9	1929	USNM		c
	9	1935	USNM		
	9,13	1892	FM	2	
	14	1909	ZMA		
	16	1949	UPRM	2	
	17	1924	USNM		c
	20,21	1912	CM	7	
	24	1934	USNM		
N=18					
April	1-3	1900	USNM	13	b
	"	"	MCZ		
	1-22	1900	AMNH	3	a

	9	1938	USNM		
	15-29	1961	LSU	13	
	"	"	DNHM	2	
	16	1928	USNM		c
	19	1943	LSU		
	25,26	1977	USNM	5	
	27	1924	COR		
	29,30	1912	USNM	2	b
N=43					
May	5-27	1912	USNM	5	b
	13,14	1970	ROM	2	
	21	1892	AMNH	2	
	?	1863	BMNH		
N=10					
June	10	1916	AMNH		
	11	1912	USNM	4	

N=5

- a - Bowdish 1903
- b - Wetmore 1927
- c - Danforth 1931

Published dates of sight reports in no way change the view that this is a common permanent resident (in appropriate habitat). It has been listed without much additional comment by, among others, Taylor (1864, as abundant), Bello (1871), Gundlach (1874, 1878b), Stahl (1882, 1887), Cory (1892), Ridgway (1902), Peters (1927), Hellmayr (1935), McCandless (1958), and Leopold (1963, as

very common). It has been observed by Bennett (1980, in mangroves) and Post (1978). Habitats from which it has been noted include the coastal plain and inland along courses of rivers (Wetmore 1916a) and particularly in mangroves (Wetmore 1927). Struthers (1923) and Danforth (1931) stressed its use of mangrove swamps and wooded areas bordering lagoons; the latter author added dry brushy regions as utilized habitat. Raffaele (1983) mentioned all of the above areas as being inhabited by this species. Gundlach (1878a) indicated that nesting began in March; Danforth (1926) witnessed nesting from April to July and possibly into August. He found 3 eggs in all of the nests he examined. Beatty (1931) described a nest containing 3 young that he found on 11 May 1925 in brush 2 ft from the edge of water and just over 2 ft above the ground. Bowdish (1903) and Danforth (1931) found nothing but insects in stomachs; Wetmore (1916a) found 100% animal matter in the 63 stomachs he examined. CBC: the most abundant warbler in coastal counts (CR and SJ); not reported from CY.

Isla Caja de Muertos - 1 spec., 23 March 1935 (USNM).

Cayo Icacos - 3 specs., all 16 June 1962 (LSU).

Isla Palomonito - 2 specs., 16 June 1962 (LSU).

Vieques - 20 specs.: 11 from 25-28 March 1900 (10 in USNM, 1 in MCZ; Wetmore 1927 noted that these were collected by Richmond), 7 from 19-20 March 1912 (USNM; Wetmore 1916b, 1927 collected these and considered the birds common "wherever trees or bushes offered it shelter"), and 2 from

24 and 27 Dec. 1935 (USNM; Danforth 1937 collected these and found insects in their stomachs). Sorrie (1975) considered it the commonest breeding warbler; he wrote that it was abundant in all habitats including small offshore cays. Listed by Ridgway (1902), Peters (1927), and Hellmayr (1935).

Luis Pena - 3 specs.: 2 on 11 April 1912 (USNM; Wetmore 1917, 1927) and 28 Dec. 1934 (USNM). Listed by Hellmayr (1935).

Culebra - 17 specs.: 13 from 8-13 April 1912 (USNM; Wetmore 1917, 1927 collected these and considered the birds abundant, not only in mangroves but in trees in dry pastures and in sea grape along the beach) and 4 from 26 Dec. 1934-2 Jan. 1935 (USNM). Listed by Peters (1927) and Hellmayr (1935).

Cayo Norte - 1 spec., 30 Dec. 1934 (USNM).

Culebrita - 2 specs.: 15 April 1912 (USNM; Wetmore 1917, 1927) and 1 Jan. 1935 (USNM). Listed by Hellmayr (1935).

Dendroica pensylvanica - Chestnut-sided Warbler.

Puerto Rico - Sightings: Jan. 1970 (Bond 1970, Leck 1972), 11 Nov. 1970 (Bond 1971), 31 Oct. (Norton 1984), and one undated (Bond 1964). Raffaele (1983) noted 9 sightings between Nov. and April.

Dendroica magnolia - Magnolia Warbler.

Mona - 1 spec., tentatively identified as this species, 5 Oct. 1944 (UPRM). Sighting, of several inds. on coastal plain (Terborgh and Faaborg 1973, also in Bond 1974; Raffaele 1973 listed this sighting plus an earlier one by Marcial).

Puerto Rico - 1 spec. reported, 26 Dec. 1900 (not located; Bowdish 1903, Cooke 1904, Wetmore 1916a, 1927). Sightings: 26 Sept. 1899 (Bowdish 1903, Cooke 1904, Wetmore 1916a, 1927), 3 Nov. 1926 (McCandless 1961), 30 Nov. and 3 Dec. 1923 (Danforth 1926, Wetmore 1927), 24 March (Norton 1985), 25 March-3 April 1922 (Danforth 1922, 1926, Wetmore 1927), and 20 April (Bent 1953). Listed by Bello (1871), Gundlach (1874, 1878a, 1878b), Stahl (1882), Cory (1892), Ridgway (1902), McCandless (1958, as irregular to sporadic), Leopold (1963), Biaggi (1970), and Raffaele (1983). CBC: 1 ind., 1976 (CR) and 1 ind., 1981 (CY).

Vieques - Sightings, 10 and 30 March 1971 (Sorrie 1975).

Dendroica tigrina - Cape May Warbler.

Mona - 2 inds. netted between 31 Jan. and 5 Feb. 1972 (Terborgh and Faaborg 1973; also in Bond 1974 and Raffaele 1973).

Puerto Rico - 35 specs.:

	day	year	mus.	nos.	ref.
Nov.	4-21	1987	LSU	13	
	20	1966	USNM		

N=14

Jan.	11	1943	UPRM		
	30	1949	UPRM		

N=2

Feb.	2	1935	USNM		
	7	1942	UPRM	6	
	7	1961	LSU		
	15	1941	UPRM		
	20	1943	UPRM	7	

N=16

March	7,9	1912	CM	2	a
-------	-----	------	----	---	---

N=2

April	17	1977	USNM		
-------	----	------	------	--	--

N=1

a - Wetmore 1927

Many additional specs. were received by Sundevall (1869, in Wetmore 1916a, 1927). Sightings: 17 Sept. (Bent 1953), 30 Oct. 1901 (Bowdish 1903, Wetmore 1927, McCandless 1961), in 1/11 Dec. Christmas counts (McCandless 1961), 8 April 1922 (Danforth 1922, 1926, Wetmore 1927, Bent 1953), and 20 April 1934 (Potts 1948). Netted in various years, but without returns or evidence of territorial behavior (Faaborg and Winters 1979, Faaborg 1982, Faaborg and Arendt

1984). Observed by Recher and Recher (1966, as abundant in interior forest), Leck (1972); it was the most common species observed by Potts (1978). Listed by Gundlach (1874, 1878a as occurring autumn to May, both on the coasts and in the interior, 1878b), Stahl (1882), Cory (1892), McCandless (1958, as uncommon but regular, Sept.-April), Leopold (1963, as uncommon but regular), Biaggi (1970, as regular but not abundant), and Raffaele (1983, as fairly common, Nov.-March, and as early as Oct. and as late as May). Barnes (1947) wrote that, although this species had been reported as rare in the lowlands, "we found it to be one of the most common migrants in the higher mountains that are well covered with dense, luxuriant vegetation." Potts (1948) also noted that it was apparently rare along the coast but common in the higher interior. Raffaele (1983) wrote that it "prefers mountain forest, but also occurs in thickets, mangroves and even gardens on the coast." Recher and Recher (1966) often observed it in mixed-species flocks in forest and more open areas. CBC: regular at CR count; not reported elsewhere.

Vieques - Sightings: a single ind., 4 April 1912 (Wetmore 1916a, 1916b, 1927), and 3 inds., 30 March-1 April 1971 (Sorrie 1975).

Dendroica caerulescens - Black-throated Blue Warbler.

All references are presumably to the nominate subspecies.

Mona - Sighting, 5 Feb. 1972 (Terborgh and Faaborg 1973; also in Bond 1974, Raffaele 1973).

Puerto Rico - 36 specs.:

	day	year	mus.	nos.	ref.
Oct.	19	1950	UPRM		
N=1					
Nov.	7	1941	UPRM		
	12-16	1987	LSU	7	
	17	1928	USNM		b
N=9					
Dec.	1	1934	USNM		
	22	1923	COR		
	23	1911	USNM		a
N=3					
Jan.	29,30	1912	USNM	2	a
N=2					
Feb.	2	1912	USNM		a
	5,15	1941	UPRM	2	
	7,20	1943	UPRM	2	
	8	1936	USNM		
	26	1900	USNM		a
N=7					
March	1,2	1941	UPRM	2	
	2	1900	USNM		a
	8	1912	USNM	2	a

	17	1965	PM		
N=6					
April	3	1938	USNM		
	4-11	1912	CM	3	a
	17	1943	UPRM		
	18	1961	LSU		
	20	1977	USNM	2	

N=8

a - Wetmore 1927

b - Danforth 1931

Additional specs. (not located): 27 and 30 Dec. 1921 (Struthers 1923, Wetmore 1927) and one or more received by Gundlach (1878a, undated). Sightings: 1 Sept. (McCandless 1961, Bond 1962), 12 Oct. 1928 and 23 Oct. 1926 (Danforth 1931, Bent 1953), 22 Dec. 1911 (Wetmore 1916a), in 2/11 Dec. Christmas counts (1956 and 1960, Mccandless 1962), in Jan. 1972 (Willis 1973), from 18 Jan. to 8 March 1912 (Wetmore 1927), 3 April (Bent 1953), and 15 April 1922 (Danforth 1922, 1931). Listed by Bello (1871), Gundlach (1874, 1878b), Stahl (1882, 1887), Cory (1892), Ridgway (1902), Leopold (1963, as fairly common), Biaggi (1970, as fairly abundant, Oct.-April), and Raffaele (1983, common, as early as Sept. and as late as May). It has been noted from dense forest (Wetmore 1916a), as common in wooded hills but rare near the coast (Danforth 1922, 1931), in forests of the interior hills and mountains to the highest altitudes but rare at low elevations (Wetmore 1927), and in the "heavy

forests of the interior" (Raffaele 1983). McCandless (1958) noted that it prefers the wooded hilly country. Danforth (1931) found nothing but insects in one stomach and Wetmore (1916a) found 75% animal and 25% plant matter in 8 stomachs. CBC: regular at highland count (CY) and rare elsewhere.

Vieques - Sightings: several inds., 27 March 1912 (Wetmore 1916a, 1916b, 1927, Danforth 1935, Sorrie 1975) and 1 ind., 30 March 1971 (Sorrie 1975).

Dendroica coronata - Yellow-rumped Warbler.

Mona - 9 specs.: 1 on 28 Feb. 1892 (FM; Hellmayr 1935) and 8 from 1 March-4 April 1944 (UPRM; Barnes 1946 and Raffaele 1973 noted 4 in this series and termed the species common; also referred to by Rolle 1961b).

Puerto Rico - 15 specs.:

	day	year	mus.	nos.	ref.
Nov.	10	1942	UPRM	2	
N=2					
Jan.	19	1912	USNM		a
N=1					
Feb.	1	1936	USNM		
	9-15	1912	CM	2	a
	"	"	USNM	1	a

N=4

March	1-21	1912	CM	7	a
	7	1927	USNM		b

N=8

a - Wetmore 1927

b - Danforth 1931

Additional specs. (not located): one or more sent to Sundevall in the 1860's (Wetmore 1927), one from the winter of an unstated year (Baird 1865, Wetmore 1927), and 20 Nov. 1926 (Danforth 1931). Sightings: normally first seen in Nov. (the last warbler to arrive; Raffaele 1983), 20 Nov. 1926 (Danforth 1931), 14 Dec. 1923 (Danforth 1926, 1931, Wetmore 1927, Bent 1953, McCandless 1961), in 4/11 Dec. Christmas counts (McCandless 1962), 5 Jan.-8 March 1912 (Wetmore 1916a, 1927), and 8 April 1922 (Danforth 1922, 1926, 1931, Wetmore 1927, Bent 1953). Observed, rarely, by Post (1978). Listed by Bryant (1866, as occurring in some number), Bello (1871), Gundlach (1878a, as the last species to arrive from the north and leaving in the end of March; also 1874, 1878b), Stahl (1882), Cory (1892), Danforth (1922, as more common in spring), McCandless (1958, as irregular) and Biaggi (1970, as sporadic, Nov.-April). It has been noted in forests and more open growth (Wetmore 1916a), in low, shrubby places or arid regions (Danforth 1922), in low bushes bordering lagoons (Struthers 1923), mostly in dry brushy regions (Danforth 1926, 1931), and in forests and open thickets but with regularity only in mangrove thickets in the southwest (Raffaele 1983). Four

stomachs examined by Wetmore (1916a) contained insects and spiders and 2 seen by Danforth (1931) contained all animal matter. CBC: sporadic at CR; not reported elsewhere.

Vieques - 3 specs.: 22 and 30 Jan. 1900 (AMNH; Bowdish 1900, 1903 noted 2 specs. from the first date and 1 from the latter; he found insects in one stomach and seeds in another; noted by Wetmore 1916b, 1927) and 24 Dec. 1935 (USNM; Danforth 1937 collected this from mangroves and found only insects in its stomach). Sightings: 1 April 1912 (Wetmore 1916a, 1916b; Wetmore 1927 referred to a spec. from this date) and 9 March 1971, by Sorrie (1975), who considered the species uncommon.

Culebra - 1 spec., 9 Feb. 1899 (USNM; Wetmore 1917, 1927).

[Dendroica townsendi - Townsend's Warbler.]

Puerto Rico - Bond (1967) considered a report from Puerto Rico to be questionable (no specific information).

Dendroica virens - Black-throated Green Warbler.

Puerto Rico - 1 spec., 5 April 1912 (CM; Todd 1925, Wetmore 1927, Bent 1953, Biaggi 1970). Sightings: 11 Oct. 1959 (McCandless 1961), Dec. 1957 (McCandless 1962), and 4 Feb. 1980 (Molinares 1980 observed and photographed this ind.). The species has been termed casual (McCandless 1958), uncommon and irregular (Leopold 1963), and rare from Oct. to March (Raffaele 1983). CBC: 2 inds., 1983 (CY).

[Dendroica fusca ~ Blackburnian Warbler.]

Puerto Rico - Sightings: undated (Bond 1964), and a total of 3: one each in Jan., Feb., and March (Raffaele 1983). CBC: reported in 1983 and 1984 CY counts. These reports should be considered in need of verification in light of the absence of well-documented mid-winter West Indian records of this species.

Dendroica dominica - Yellow-throated Warbler.

Mona - 1 spec., 5 Oct. 1944 (UPRM; Barnes 1946, Rolle 1961b, Raffaele 1973). E. P. Edwards (pers. comm.) indicated that he collected a spec. on 2 Oct. 1953; neither he nor I know the whereabouts of the spec.

Puerto Rico - 5 specs.:

	day	year	mus.	nos.	ref.
Sept.	17	1943	UPRM		
N=1					
Nov.	30	1933	USNM		
N=1					
Dec.	18	1926	USNM		a
	26	1900	AMNH		
N=2					
Feb.	28	1942	UPRM		
N=1					
a - Danforth 1931					

At least one additional spec. reported, undated (not located; Sundevall 1869, Wetmore 1916a, 1927). Gundlach (1878a) found it commonly in many types of habitats from Sept.-March and may have collected specs. (Wetmore 1927). Sightings: 28 Aug. (Bent 1953), 6 Oct. (McCandless 1961), 11 Nov. and 31 Dec. 1921 (Danforth 1922, 1931, Wetmore 1927), 19 and 27 Dec. 1923 and 23 Jan. 1924 (Danforth 1931), and 29 Jan. 1922 (Struthers 1923; Wetmore 1927 added that this bird was present for about 6 weeks in Jan. and Feb.). Listed by Bello (1871), Gundlach (1874, 1878b), Stahl (1882), Cory (1892), Leopold (1963, as rather uncommon), Biaggi (1970, from Oct.-Feb. but most commonly in Dec. and Jan.), and Raffaele (1983, from Oct.-April). It has been noted from coastal palms and also in mangroves (McCandless 1958, Leopold 1963, Biaggi 1970, Raffaele 1983). CBC: sporadic and rare at CR; not reported elsewhere.

Dendroica a. adelaidae- Adelaide's Warbler.

This species was described by Baird (1865) on the basis of a specimen collected in Jan. 1865 on Puerto Rico. Other populations subsequently discovered on St. Lucia and Barbuda in the Lesser Antilles have been designated distinct subspecies. As a result, those birds from Puerto Rico and Vieques are assigned to the nominate subspecies.

Puerto Rico - 127 specs.:

	day	year	mus.	nos.	ref.
July	1	1979	USNM		
	3	1912	USNM	2	c
N=3					
August	5	1900	AMNH		a
	13	1927	ANSP		
	15	1892	AMNH		
	19-22	1912	USNM	7	c
	24-27	1962	LSU	3	
N=13					
Sept.	23	1924	USNM		d
N=1					
Oct.	3	1924	USNM		d
	12	1935	USNM		
	"	"	UPRM		
	26	1935	UMMZ		
	29,31	1987	LSU	2	
N=6					
Nov.	3	1934	DENV	2	
	16-19	1987	LSU	14	
	18	1900	AMNH		
N=17					
Dec.	16	1928	ANSP		
	18-23	1911	USNM	4	c
N=5					
Jan.	3	1912	USNM	2	c

	5	1939	USNM		
	12	1935	USNM	3	
	30	1949	UPRM	2	
N=8					
Feb.	3, 5	1934	USNM	2	
	4, 5	1907	BMNH	4	
	7	1912	CM		c
	12	1912	USNM	2	c
	14	1929	USNM		d
	16	1935	USNM		
	22	1968	ROM		
	28	1941	LSU		
	28	1965	LSU	2	
N=15					
March	3, 5	1965	LSU	2	
	4-13	1912	CM	7	
	6	1930	MCZ		
	16	1949	UPRM		
	24	1971	SWK		
N=12					
April	12, 13	1971	ROM	4	
	14-19	1977	USNM	8	
	20	1935	DENV		
	27	1961	LSU	4	
	30	1912	USNM	3	c
			MCZ		c

N=21

May	1	1912	MCZ		c
	1-22	1912	USNM	13	c
	12-14	1970	ROM	5	
	18-26	1900	USNM	3	a
	30	1924	COR		

N=23

June	15	1900	USNM		ab
------	----	------	------	--	----

N=1

- a - Bowdish 1903
- b - Wetmore 1916a
- c - Wetmore 1927
- d - Danforth 1931

There have been numerous listings and published sightings that do little to expand upon the above list of specimens. Included among these are Bryant (1865, 1866), Gundlach (1874, 1878a, 1878b), Sharpe (1885), Cory (1886, 1892), Stahl (1882, 1887), Ridgway (1902), Hellmayr (1935), Bond (1950), McCandless (1958), Leopold (1963), Lowery and Monroe (1968), and Post (1978). Birds have been frequently netted, including an recaptured ind. at least 7 years of age (Faaborg and Winters 1979, 1980, Faaborg 1980, Faaborg and Arendt 1984). Raffaele (1983) summarized habitat use as follows: "most common in the dry scrubland of the south coast, but also occurring in thickets on the north coast, the haystack hills, and sparingly into the mountains. It is absent from the extreme eastern end of the island." This description includes all situations described by Wetmore

(1916a, 1927), Danforth (1926, 1931), Bond (1930), and Biaggi (1970). Nests have been found and described by Danforth (1926), Wetmore (1927), Beatty (1931), and Spaulding (1937) from dates ranging from 14 April to 22 May. Raffaele (1983) wrote, in summary, that 3 eggs are laid in nests located in dense thickets from 3-8 ft above the ground. One or more stomachs were examined by Bowdish (1903), 41 by Wetmore (1916a), 3 by Danforth (1926), and 1 more by Danforth (1931). In all cases, contents were 100% animal matter, largely insects. CBC: abundant at CR (mean = 58 birds/count); sporadic elsewhere.

Vieques - 7 specs.: 5 from 20-25 March 1912 (USNM; Wetmore 1916a, 1916b, 1927 collected these and considered the species locally common in brush-covered valleys of the northern side of the island and the hot dry region of the south coast; they were breeding in late March; this was the first report of the species from the island) and 2 from 27 Dec. 1935 (USNM; Danforth 1937 noted 3 specs., the stomachs of which contained insects and spiders; he considered the species locally common on brush covered hills). Sorrie (1975) found them in only one dry limestone forest site and noted that the locales from which Danforth (1937) had reported them are now United States Navy restricted areas or target sites, and that this bird may be becoming a victim of habitat destruction (these notes were repeated by Bond 1977). Listed by Bond (1930, 1950, 1979), Danforth (1935),

Hellmayr (1935), Leopold (1963), Lowery and Monroe (1968), Biaggi (1970), the AOU (1983), and Raffaele (1983).

[Dendroica pinus - Pine Warbler.]

Puerto Rico - The report of 1 ind. in the 1984 SJ CBC of this unlikely species requires that it be included in a hypothetical list.

Dendroica discolor - Prairie Warbler.

Mona - 8 specs.: 1 on 18 Feb. 1888 (FM; Cory 1892, Ridgway 1902, Wetmore 1927, Hellmayr 1935, Bond 1946) and 7 at UPRM that roughly correspond to the dates of those collected by Barnes (1946). He noted the 3 in the collection from 23 March 1944, 2 from 5 Oct. 1944 (there is one from that date and one undated that may be the second), and 1 from 12 Nov. 1944 (the spec. at UPRM is from that date in 1943). In addition to those listed by Barnes, there is a 6 March 1944 spec. Rolle (1961b) and Raffaele (1973) both considered it common.

Puerto Rico - 55 specs.:

	day	year	mus.	nos.	ref.
Aug.	27	1962	LSU		
N=1					
Sept.	7	1930	USNM		
	30	1901	AMNH		b
N=2					
Oct.	4	1941	UPRM		

	5,27	1901	AMNH	2	
	12	1935	USNM		
	24	1936	UPRM		
	29-30	1987	LSU	4	
N=9					
Nov.	4-29	1987	LSU	11	
	6	1928	USNM		e
	10	1916	USNM		
N=13					
Dec.	29	1911	USNM		d
N=1					
Jan.	2-30	1912	USNM	3	d
	8	1899	USNM		d
	11	1943	UPRM		
N=5					
Feb.	2	1935	USNM		
	5	1907	BMNH		
	5	1934	USNM		
	5,9	1892	FM	2	
	14	1927	USNM		e
	15	1912	CM		
	21	1941	UPRM	2	
N=9					
March	5-19	1912	CM	7	
	6-23	1944	UPRM	4	
	21	1941	UPRM		
	23	1942	UPRM		

N=13

April 4 1924 COR c

N=1

undated BMNH a

N=1

- a - Sharpe 1885
- b - Bowdish 1903
- c - Danforth 1926
- d - Wetmore 1927
- e - Danforth 1931

Additional specs. (not located): from the winter of 1864 (Baird 1865; Bryant 1865, 1866 noted a spec., probably the same one) and from 21 March 1924 (Danforth 1926).

Sightings: Sept. (Gundlach 1878a), 7 Sept. (Bent 1953, McCandless 1961), 20 Sept. (Danforth 1926), 23 Sept. 1900 (Bowdish 1903), in 11/11 Dec. Christmas counts (McCandless 1962), 1 Jan. 1924 (Danforth 1926), 22 April 1922 (Danforth 1926, 1931, Nolan 1978), and 23 April 1927 (Danforth 1931, Bent 1953, Nolan 1978). It has been netted frequently and there have been at least 4 returns (Faaborg and Winters 1979, 1980, Faaborg 1982); there was no evidence of territorial behavior in the netting patterns (Faaborg and Arendt 1984). Listed by Bello (1871), Gundlach (1874, 1878b), Stahl (1882), Cory (1892), Ridgway (1902), Danforth (1922, as fairly common but locally distributed), Hellmayr (1935), Leopold (1963), Biaggi (1970, as abundant, Sept.-April), Post (1978), and Raffaele (1983, as common).

McCandless (1958) wrote that it prefers fence and roadside brush in the lowlands. Nolan (1978) emphasized dry places as preferred habitat, including growth behind beaches, pastures with thickets, low bushes, hedges, and coffee fincas; the birds avoid heavy forest, but a few are found in mangroves. Wetmore (1916a) found entirely animal matter (80% insects, 20% spiders) in 15 stomachs; Danforth (1926, 1931) reported almost exclusively insects in 2 and Bowdish (1903) also noted only insects in 1 stomach. CBC: regular at CR and infrequent at other counts.

Vieques - 10 specs.: 7 from 17-27 Jan. 1900 (AMNH; Bowdish 1900 collected these and considered the species abundant; also in Wetmore 1927), 1 on 19 March 1912 (USNM; Wetmore 1916a, 1916b, and 1927 indicated that he collected this plus one other on 25 March [not located] and the species was common, especially during waves on 19 and 27 March, and was present in numbers up until his departure on 4 April), and 1 each on 26 and 27 Dec. 1935 (USNM; Danforth 1935, 1937 indicated that their stomachs contained insect matter). Richmond noted the species' presence on 24 March 1900 (in Wetmore 1927). Sorrie (1975) considered them fairly common in thorn scrub and on dry slopes.

Culebra - 4 specs.: 9 Feb. 1899 (USNM; Wetmore 1927 noted these; Ridgway 1902 listed the island presumably on this basis), 9 and 10 April 1912 (USNM; Wetmore 1916a, 1917, and 1927 noted these and a third taken 6 April [not

located]), and 27 Dec. 1934 (USNM; Danforth 1935 noted that this bird's stomach contained insects).

Dendroica palmarum - Palm Warbler.

All reports are presumably of the nominate subspecies.

Mona - 2 specs., both 26 Oct. 1944 (UPRM; Barnes 1946, Rolle 1961b, Raffaele 1973 [incorrectly as 26 Jan. 1944]).

Puerto Rico - 23 specs.:

	day	year	mus.	nos.	ref.
Oct.	24-31	1936	USNM	3	
N=3					
Nov.	14	1942	UPRM		
	18,19	1987	LSU	6	
N=7					
Dec.	2	1933	USNM		
	2	1942	UPRM	2	
	16	1928	USNM		d
N=4					
Jan.	8	1899	USNM		bc
N=1					
Feb.	12	1900	AMNH		abc
	16	1912	USNM		b
	21	1941	UPRM		
N=3					
March	5	1041	UPRM		
	10	1900	AMNH		abc

	23	1912	CM	c
N=3				
April	4	1900	USNM	bc
	8	1900	AMNH	abc

N=2

- a - Bowdish 1903
- b - Wetmore 1916a
- c - Wetmore 1927
- d - Danforth 1931

Sightings: late Sept. and early Oct. 1943 (Barnes 1947, McCandless 1961), 24 Oct. (Bent 1953), in Dec. 1926 and 1928 Christmas counts (McCandless 1962). The 8 April 1900 spec. date was listed as a late spring date by Cooke (1904) and Bent (1953). Observed by Post (1978). Listed by Bello (1871), Gundlach (1874, 1878a [perhaps on the basis of specs. in his possession], 1878b), Stahl (1882, 1887, again perhaps on the basis of specs.), Cory (1892), Ridgway (1902), McCandless (1958, as irregular near the coast), Leopold (1963, as an irregular visitant), Biaggi (1970, as not abundant, Dec.-April), and Raffaele (1983, as uncommon, Sept.-April). They usually feed on the ground, at times among bushes or at margins of thickets (Wetmore 1927); Raffaele (1983) found them "primarily inhabiting mangrove fringes and thickets near water." CBC: regular at CR count but not reported elsewhere.

Vieques - Sighting, in mangroves, 9 March 1971 (Sorrie 1975).

[Dendroica castanea - Bay-breasted Warbler.]

Mona - 1 spec. reported, 10 Oct. 1953 (not located; McCandless 1958, Leopold 1963, Biaggi 1970, Raffaele 1973, 1983). These authors all indicated that this spec. was collected by E. P. Edwards. Edwards (pers. comm.), however, has no mention of this species in his field notes. Instead, he wrote that he collected a spec. of Dendroica striata, a species similar in appearance to castanea, on 5 Oct. 1953. He concedes that he may have initially misidentified the bird. Neither Edwards nor I know of the whereabouts of the bird in question, nor how the reference to castanea became established in the literature.

Puerto Rico - Sightings: 12 Oct. 1957 (McCandless 1961), 3 Feb. (Raffaele 1983). McCandless (1958) termed fall observations "uncertain" and Rolle (1961a) suggested that the species be considered hypothetical.

Dendroica striata - Blackpoll Warbler.

Mona Passage - 2 specs. were collected aboard a ship between Hispaniola and Mona on 2 Oct. 1969 (ZMA).

Mona - See the discussion of this island under Dendroica castanea; if Edward's initial determination was correct, it would be the sole Blackpoll record for the island (coming at a time when this bird typically migrates through the region).

Puerto Rico - 18 specs.:

	day	year	mus.	nos.	ref.
Oct.	4-13	1941	UPRM	5	
	13	1928	USNM	2	a
	14	1942	UPRM		
	18	1888	FM		
	23	1966	SWK		
	29	1987	LSU	3	

N=13

Nov.	1	1930	USNM		
	3,4	1987	LSU	3	
	6	1943	UPRM		

N=5

a - Danforth 1931

There is apparently another spec. Wetmore (1927) wrote that "Gundlach states in one reference [1878b] that he secured a black-poll warbler in September, but in another place [1878a] says that he observed the species in Aguadilla in September and saw one that had been killed in Bayamon. The latter is probably the bird listed by Stahl [1887] as in his collection." Sightings: in mid-Aug. (Stahl 1887; Wetmore 1927 considered this claim doubtful), 24 Sept. (McCandless 1961, Bent 1953), 1 Oct.-11 Nov. (McCandless 1961), 13 Oct. 1928 (Danforth 1931 saw at least 150 inds. on this date, including the 2 specs. listed above; also in Biaggi 1970), 11 and 12 Nov. 1921 (Struthers 1923, Wetmore 1927), and 26 Nov. (Bent 1953). McCandless (1962) noted it

in Dec. 1926 and 1955 Christmas counts, and also as a rare spring migrant (McCandless 1961). There is also a 7 June 1958 sight report by McCandless (published by Bond 1959, rather than by the observer). Also listed by Bello (1871), Stahl (1882), and McCandless (1958). CBC: reported in 3 CR and 1 CY counts (all Dec. reports of this species this far north should be considered hypothetical).

Dendroica angelae - Elfin Woods Warbler.

Puerto Rico - Kepler and Parkes (1972) described this species and some aspects of its biology. In more recent work, its distribution, habitat use, and population densities (Cruz and Delannoy 1984a) and feeding ecology (Cruz and Delannoy 1984b) have been detailed. There is no need to reiterate this information here. There were 6 specs. originally collected by Kepler or Parkes in 1971: 1 on 18 May and the others on 14-16 July (4 in CM, 2 in USNM). There are also 7 specs. collected in the Maricao State Forest, 12-16 Nov. 1987 (currently at LSU).

Mniotilta varia - Black-and-white Warbler.

Mona - 1 spec. located, 23 Feb. 1892 (FM; Cory 1892, Wetmore 1927, Hellmayr 1935, Bond 1946, Rolle 1961b) and another reported, 6 Oct. 1944 (not located; Barnes 1946 collected this and considered the species common; also in Rolle 1961b, Raffaele 1973).

Puerto Rico - 36 specs.:

	day	year	mus.	nos.	ref.
Oct.	12	1926	USNM		b
	12	1928	USNM		b
	14	1941	UPRM		
	19	1935	USNM		
	24	1888	FM	2	
	30,31	1987	LSU	4	
N=10					
Nov.	3-17	1987	LSU	8	
	8	1926	USNM		b
N=9					
Dec.	16	1933	USNM		
	30	1911	USNM		a
N=2					
Jan.	30	1912	USNM		a
N=1					
Feb.	7	1941	UPRM		
N=1					
March	5	1892	FM		
	6,17	1965	LSU	2	
	8	1941	UPRM		
	29,30	1912	CM	3	
N=7					
April	10-22	1912	CM	3	
	13	1971	ROM		
	14	1977	USNM		

16 1961 LSU

N=6

a - Wetmore 1927

b - Danforth 1931

Additional specs. (not located): 21 Dec. 1911 and 27 Jan. 1912 (Wetmore 1927). Sightings: 17 July 1921 (Struthers 1923 observed this, but commented that most migrants arrived later in Aug.; there is a possibility that what Struthers saw in July was actually D. angelae), 17 Sept. (McCandless 1961), 6 Oct. 1926 (Danforth 1931), 10 Oct. 1901 (Bowdish 1903, Wetmore 1927), in 9/11 Dec. Christmas counts (McCandless 1962), 27 April (Bent 1953), 29 April 1922 (Danforth 1922, 1926, Wetmore 1927), 30 April 1912 (Wetmore 1916a, 1927), and 30 April 1927 (Danforth 1931). McCandless (1958) considered it common in woods, Sept.-April. Netted frequently, with at least 6 returns (Faaborg and Winters 1979, 1980, Faaborg 1982, Faaborg and Arendt 1984). Observed by Recher and Recher (1966), Leck (1972), Willis (1973), and Post (1978). Listed by Bello (1871), Gundlach (1874, 1878a, 1878b), Stahl (1882, 1887), Cory (1892), Leopold (1963, as common), Biaggi (1970, as fairly abundant, Oct.-April), and Raffaele (1983, as fairly common, Sept.-April). This species is typically found in many kinds of wooded regions (Wetmore 1916a, 1927, Danforth 1926, 1931, Raffaele 1983) that include coffee and citrus "fincas" (Struthers 1923, Danforth 1926) and mangroves (Danforth 1931), from sea level to the summits of mountains

(Recher and Recher 1966). Danforth (1931) examined 2 stomachs that contained entirely animal matter, mostly insects; he had observed one of these birds eating a rather large lizard. Wetmore (1916a) found 100% animal matter, mostly beetles, in the 11 stomachs that he checked. CBC: regular but not abundant.

Vieques - 2 specs.: 17 and 30 Jan. 1900 (AMNH; Bowdish 1900 noted 3 specs.; Wetmore 1916b noted 1 spec. from the latter date in Richmond's collection; listed subsequently by Bowdish 1903, Wetmore 1916a, 1927). Sightings: 27-29 March 1912 (Wetmore 1916b, 1927), 24 Dec. 1935 (Danforth 1937) and 10 March and 1 April 1971 (Sorrie 1975). Listed by Danforth (1935).

Culebra - 1 spec. located, 8 April 1919 (USNM) and 1 other spec. reported, 9 April 1912 (not located; Wetmore 1917 collected this and observed another on 12 April; also in Wetmore 1927, Danforth 1935).

Setophaga ruticilla - American Redstart.

Mona - 1 spec., 4 April 1944 (UPRM; Barnes 1946 collected this and considered it rather common; also in Raffaele 1973). Sightings: Oct. 1962 and 12 Dec. 1971 (Raffaele 1973).

Puerto Rico - 32 specs.:

	day	year	mus.	nos.	ref.
Oct.	12	1935	USNM		
	17,21	1901	AMNH	2	
N=3					
Nov.	4	1900	AMNH		a
	7	1941	UPRM		
	8	1926	USNM		c
N=3					
Dec.	1	1900	AMNH		
	18-30	1911	USNM	4	
N=5					
Jan.	3	1912	USNM		
	10,21	1899	USNM	2	
	11	1936	COR		
N=4					
Feb.	7	1941	UPRM	2	
	12,21	1912	USNM	2	
N=4					
March	1	1900	USNM		
	1-15	1941	UPRM	4	
	5	1968	ROM		
	5-10	1892	FM	3	
	7	1936	USNM		
N=10					

April	12	1971	ROM	2	
	18	1924	COR		b

n=3

a - Bowdish 1903

b - Danforth 1926

c - Danforth 1931

Gundlach (1878a) referred to this as one of the first warblers to arrive in Aug.; Stahl (1887) also noted their mid-Aug. arrival. Sightings: 2 Sept. (McCandless 1961), 17 Sept. (Bent 1953), 22 Sept. 1926 (Danforth 1931), 23 Sept. 1921 (Struthers 1923), 24 Sept. 1900 (Bowdish 1903), in 11/11 Dec. Christmas counts (McCandless 1962), 9 April 1921 (Struthers 1923), 26 April 1924 (Danforth 1922, 1926, 1931, Bent 1953), and 3 May 1928 (5 inds. observed together, Danforth 1931). Netted frequently, with a few returns but no evidence of territorial behavior (Faaborg and Winters 1979, 1980, Faaborg 1982, Faaborg and Arendt 1984). Observed by Recher and Recher (1966), Willis (1973), Post (1978), and Bennett (1980). Noted as common from late Aug. to early May (McCandless 1958). Listed by Bryant (1865, 1866), Bello (1871), Gundlach (1874, 1878b), Salvin and Godman (1881), Stahl (1882), Cory (1892), Danforth (1922, as the second most common warbler), Hellmayr (1935), Leopold (1963, as common), Biaggi (1970, as abundant, Sept.-May), and Raffaele (1983, as common, Sept.-April, with Aug. and May records). Wetmore (196, 1927) noted them from mangroves, forests, coffee plantations, and sometimes shade

trees about houses. Danforth (1931) considered them most abundant in wooded regions, but also occurring in shade trees, mangroves, and brushy regions. Virtually any habitat with trees is appropriate according to Biaggi (1970); Raffaele (1983) concurred, noting occurrences in forested areas from the mountains to the mangroves. 13 stomachs examined contained 100% animal matter, virtually all insects (Wetmore 1916a); another stomach contained insects exclusively (Danforth 1926). CBC: regular and relatively common at CR and CY; not reported at SJ.

Cayo Santiago - 1 spec., 15 Jan. 1959 (MVZ).

Vieques - 2 specs.: 30 Jan. 1900 (AMNH; Bowdish 1900, 1903 noted 2 specs., with 30 Nov. 1899 the only date mentioned) and 29 Dec. 1935 (USNM; Danforth 1937 collected this and found only insects in its stomach). Wetmore (1927) reported a 24 March 1900 date from Richmond, and observed birds from 16 March to 4 April 1912 (also in Wetmore 1916b). Sorrie (1975) considered them common in mangroves, thorn scrub, and moist coastal forest.

Luis Pena - Sighting, 11 April 1912 (Wetmore 1917, 1927).

Culebra - 2 specs., 9 and 12 April 1912 (USNM; Wetmore 1916a, 1917, 1927 considered them fairly common and observed an ind. as late as 19 April).

Protonotaria citrea - Prothonotary Warbler.

Puerto Rico - Sightings: 22 Aug. 1962 (Schwartz and Klinikowski 1963), 12 Oct. 1957 (Bond 1959, McCandless 1961), 11 Nov. (McCandless 1961, Bond 1962), Dec. 1956 (McCandless 1962), in mangroves from Jan.-March 1957 (McCandless 1958, 1961, Bond 1959); at least 3 inds. netted in Jan. of 1976, 1978, and 1980 (Faaborg and Arendt 1984, Bond 1978, Faaborg 1982); one ind. was banded in 1976 and recaptured in each of the other two years (Faaborg 1979, Faaborg and Winters 1980). Observed by Post (1978). Listed by Leopold (1963), Biaggi (1970), and Raffaele (1983); Rolle (1961a) suggested listing it as hypothetical in Puerto Rico. CBC: in 5/15 CR counts and once at SJ; never at the highland CY count.

Helmitheros vermivorus - Worm-eating Warbler.

Puerto Rico - Sighting, 15 Oct. 1943, "the day after a small hurricane had passed" (Barnes 1947, Bond 1950, Bent 1953, Biaggi 1970). McCandless (1958) noted 3 reports in 3 different years, 12-15 Oct., and later (McCandless 1961) claimed it from 12 Oct.-1 Nov. Leopold (1963) considered it a casual fall transient, and Raffaele (1983) called it uncommon from Oct. to April in "the heavy forests of the interior mountains." Rolle (1961a) had suggested considering it hypothetical.

Vieques - Sighting, "an excellent look" on 30 March 1971 (Sorrie 1975).

Seiurus aurocapillus - Ovenbird.

Mona - 1 spec., 4 April 1944 (UPRM; Barnes 1946, Rolle 1961b, Raffaele 1973). Sighting, Dec. 1971 (Raffaele 1973).

Puerto Rico - 37 specs.:

	day	year	mus.	nos.	ref.
Oct.	8	1980	CM		
	17,31	1888	FM	2	
	21	1901	AMNH		ab
	23	1926	USNM		c
	26	1935	USNM		
	30,31	1987	LSU	2	
	31	1936	UPRM		
	"	"	USNM		

N=10

Nov.	3-12	1987	LSU	4	
	11	1888	AMNH		
	14	1888	FM		
	17	1926	USNM		c
	17	1942	UPRM		

N=8

Dec.	1	1900	AMNH		a
	21	1911	USNM		b

N=2

Jan.	19,27	1912	USNM	2	b
------	-------	------	------	---	---

N=2

Feb.	13	1899	USNM	b
	23	1912	USNM	b

N=2

March	5-27	1968	ROM	3
	11	1892	FM	

N=4

April	1-10	1912	CM	6	b
	3	1938	USNM		
	8	1900	USNM		b
	21	1977	USNM		

N=9

a - Bowdish 1903

b - Wetmore 1927

c - Danforth 1931

Additional spec. (not located): 21 Dec. 1923 (Danforth 1926). Sightings: 18 Sept. 1927 (Danforth 1931), 24 Sept. 1924 (Danforth 1926, 1931, Wetmore 1927), Oct. (Gundlach 1878a), 3 Oct. (Bent 1953), 5 Oct. (McCandless 1961), 14 Oct. 1901 (Bowdish 1903, Wetmore 1916a), 18 Oct. 1921 (Struthers 1923, Wetmore 1927), in 2/11 Dec. Christmas counts (1928 and 1959, McCandless 1962), 18 April 1921 (Struthers 1923, Danforth 1926, Wetmore 1927), 20 April 1922 (Danforth 1922, 1926, 1931, Wetmore 1927), and 25 April 1929 (Danforth 1931, Bent 1953). This species has been netted frequently and is the only species for which netting locations showed a pattern likely to be associated with territorial behavior (Faaborg and Winters 1979, 1980,

Faaborg 1982, Faaborg and Arendt 1984). Observed by Post (1978). Listed by Bello (1871), Gundlach (1874, 1878b), Stahl (1882, 1887), Cory (1892), Danforth (1922, as fairly common), Hellmayr (1935), Leopold (1963, as common), Biaggi (1970, as relatively abundant, Sept.-April), and Raffaele (1983, as fairly common Oct.-April, with some arriving in Sept.). It has been noted walking on the forest floor (Gundlach 1878a), in wooded foothills and mountains (Struthers 1923), in thickets and second-growth forests (Wetmore 1916a), as well as in canefields and mangroves (Wetmore 1927). Danforth (1926) considered it most common in coffee plantations, and added that it is also not uncommon in brushy regions (Danforth 1931). McCandless (1958) felt that it prefers coffee groves. Raffaele (1983) wrote that it "dwells principally among the leaf litter of forests in the interior where it is silent and easily overlooked. It also occurs in dry thickets and even in mangroves." Danforth (1926) found 72% plant matter (including lots of grass seeds) in one stomach and estimated that contents of two others were 89% plant (seeds and small fruits) and only 11% animal. Wetmore (1916a) examined one stomach and found 38% plant matter, mostly seeds, and 62% animal matter. CBC: reported at CR in 3/15 counts; never in the other circles.

Vieques - 5 specs.: 26 Jan. 1900 (AMNH; Bowdish 1900, 1903 noted a 16 Jan. spec., probably the same ind., and observed several others; also in Wetmore 1927), 28 March

1900 (USNM; Wetmore 1927 indicated that Richmond collected this and had seen another on 24 March), 19 and 20 March 1912 (USNM; Wetmore 1916b collected these and noted them as especially common on 19 and 27 March, apparently in transit; also in Wetmore 1916a, 1927), and 31 Dec. 1935 (USNM; Danforth 1937 collected this in addition to another spec. on 29 Dec. [not located]; the birds' stomachs contained organic matter that was about 50% seeds and 50% beetles, in addition to sand and gravel). Sighting, 10 March 1971 (Sorrie 1975).

Culebra - 1 spec., 11 Feb. 1899 (USNM; noted by Wetmore 1917, 1927).

Seiurus noveboracensis - Northern Waterthrush.

Mona - 2 specs.: 23 Feb. 1892 (FM; Cory 1892, Hellmayr 1935, Bond 1946) and 23 March 1944 (UPRM; Barnes 1946 listed 24 March as a date for this spec.; also in Rolle 1961b and Raffaele 1973). Bowdish (1903) collected a spec. on 18 Aug. 1901 that he identified as S. noveboracensis (as noted by Wetmore 1916a and Bent 1953 as a late date); Wetmore (1927), however, determined that this was actually a Louisiana Waterthrush. Raffaele (1973) reported hearing a bird on 4 Dec. 1971, and Schmidt (1926) included it in a list from the island.

Puerto Rico - 43 specs.:

	day	year	mus.	nos.	ref.
Sept.	16	1932	USNM		
	17	1943	UPRM		

	23	1924	COR		c
N=3					
Oct.	8	1936	UPRM		
	9	1926	USNM		e
	15	1935	USNM		
	22	1966	SWK	3	
	29,30	1987	LSU	3	
N=9					
Nov.	3,4	1987	LSU	9	
	3,29	1926	USNM	2	e
	14	1942	UPRM		
	30	1900	AMNH		ad
N=13					
Jan.	4	1938	USNM		
	11	1936	USNM		
	11	1943	UPRM		
	12	1935	USNM		
	30	1949	UPRM		
N=5					
Feb.	3-21	1941	UPRM	5	
	14	1912	USNM		bd
N=6					
March	5	1944	UPRM		
	9	1935	USNM		
N=2					
April	1	1900	USNM		d
	4	1924	COR		c

6	1928	USNM	2	e
8	1924	USNM		ce

N=5

- a - Bowdish 1903
- b - Wetmore 1916a
- c - Danforth 1926
- d - Wetmore 1927
- e - Danforth 1931

Additional spec. (not located): 11 April 1924 (Danforth 1926). Sightings: 30 Aug. (Wetmore 1916a, 1927, McCandless 1961), Sept. (Gundlach 1878a), 3 Sept. 1924 (Danforth 1926, 1931, Wetmore 1927), in 10/11 Dec. Christmas counts (McCandless 1962), 23 April 1921 (Struthers 1923, Wetmore 1927), 30 April 1924 (Danforth 1926, 1931, Wetmore 1927), 30 April 1928 (Danforth 1931), and 10 May (Bent 1953). Post (1978) observed that 77% of foraging efforts were on the ground and 19% more were up to 1 m above ground. No more than 2 inds. were netted in 10 seasons of netting efforts (Faaborg and Winters 1979, Faaborg 1982, Faaborg and Arendt 1984). Listed by Gundlach (1874, 1878b), Stahl (1882), Cory (1892), Leopold (1963, as common), Biaggi (1970, as fairly abundant, Sept.-April), and Raffaele (1983, as very common, Sept.-April). Gundlach (1878a) noted it from various aquatic habitats; Wetmore (1916a) wrote that it only occurs in mangroves. Danforth (1931) confirmed that it is most abundant in mangroves, but that it is also common at fresh water lagoons and along streams. McCandless (1958) felt

that it was common in lowland marshes and mangroves from late Aug. to May. The contents of 4 stomachs were mostly insects (43% Diptera) with a few small crabs and one small fish (Wetmore 1916a). CBC: abundant at lowland sites (CR and SJ) but not reported from the highland CY count.

Cayo Santiago - 1 spec., 16 Jan. 1959 (MVZ).

Vieques - 2 specs.: 24 and 30 Dec. 1935 (USNM; Danforth 1937 collected these and observed birds frequently). Sorrie (1975) considered them abundant in mangroves in winter.

Luis Pena - Sighting, 11 April 1912 (Wetmore 1916a, 1917, 1927).

Culebra - 3 specs.: 1 on 6 April and 2 on 12 April 1912 (USNM; Wetmore 1916a, 1917, 1927 considered them common from 5-21 April).

Seiurus motacilla - Louisiana Waterthrush.

Mona - 1 spec. reported, 18 Aug. 1901 (in the USNM, according to Wetmore 1927, but not located; Bowdish 1903 originally identified this as Seiurus noveboracensis; Wetmore 1927 changed the identification to motacilla; subsequently noted by Barnes 1946, Bond 1946, Bent 1953, Rolle 1961, and Raffaele 1973).

Puerto Rico - 7 specs.:

	day	year	mus.	nos.	ref.
Dec.	4	1926	USNM		c

N=1

Jan. 17-29 1912 USNM 5 ab

N=5

Feb. 17 1943 UPRM

N=1

a - Wetmore 1916a

b - Wetmore 1927

c - Danforth 1931

Additional spec.: 30 Nov. 1900 (not located; Bowdish 1903, Wetmore 1927). Sightings: 14 Aug. (McCandless 1961), 31 Aug. 1921 (Struthers 1923, Wetmore 1927), 6 Sept 1924 (Danforth 1926, 1931, Wetmore 1927), 29 Oct. 1927 and 12 Oct 1928 (Danforth 1931), in 5/11 Dec. Christmas counts (McCandless 1962), Jan. and Feb. 1912 (Wetmore 1927), 4 and 7 March 1912 (Wetmore 1927), 25 March 1921 (Struthers 1923), various dates in April, the latest 22 April 1922 (Danforth 1922, 1926, 1931, Wetmore 1927, Bent 1953), and 24 May 1966 (Recher and Recher 1966; this may have been noveboracensis at this late date). Listed by Leopold (1963, as a common winter resident), McCandless (1958, as common along streams in hills), Biaggi (1970, from Aug.-April; one of the first warblers to arrive in autumn), and Raffaele (1983, as fairly common, as early as Aug. and as late as May). Wetmore (1927) commented that "early writers have probably confused this bird with the true water-thrush" as an explanation for the lack of mention of a reasonably common species in the early literature (Bowdish 1903 is the earliest reference). The Louisiana Waterthrush has been noted from mangrove

swamps and rapid streams inland (Wetmore 1916a, 1927, Danforth 1926). Danforth (1931) stressed its preference for swiftly flowing streams in the interior, as did Struthers (1923), Biaggi (1970), and Raffaele (1983). CBC: sporadic in all 3 count circles.

Vieques - 4 specs.: 7 Feb. 1899 (USNM; Wetmore 1916b, 1927 noted that this was collected by Baker), and a series of 3 collected by Bowdish (1900, 1903) on 27 Dec. 1899, 22 Jan. 1900 (both AMNH), and 29 Jan. 1900 (USNM; all noted by Wetmore 1916b, 1927). Sightings, up to 27 March 1912 (Wetmore 1916b, 1927). Sorrie (1975) noted that 1) neither he nor Danforth saw this species, 2) that while Wetmore (1916b) reported it, he did not report the Northern Waterthrush, and 3) that "on Puerto Rico this species is found along mountain streams, which are virtually absent on Vieques." Sorrie (1975) also noted that Bowdish reported both waterthrushes (but note Bowdish's apparent difficulties in identification under Mona) and generally intimated that the status of this species on Vieques was questionable. However, the above specimens, identified correctly as far as I know, document presence in mid-winter.

Oporornis formosus - Kentucky Warbler.

Puerto Rico - Sightings: 15 Oct. 1956 and 12 Oct. 1957 (Bond 1959, McCandless 1958, 1961; Biaggi 1970 noted, probably incorrectly, that a McCandless sighting occurred in Oct. 1955). Raffaele (1983) included 5 reports from Puerto

Rico. Rolle (1961a) suggested leaving this species in a hypothetical status. CBC: reported twice at CR.

Oporornis agilis - Connecticut Warbler.

Mona - 1 spec., 6 Oct. 1953 (not located; McCandless 1958, Leopold 1963, Biaggi 1970, AOU 1983, Raffaele 1973, 1983). Edwards (pers. comm.) collected this bird but had written a question mark after its identification in his field notes. Given conflicts between his notes and subsequent literature references to a Blackpoll (or Bay-breasted) Warbler on 5 (or 10) Oct. 1953 (see discussion under those species), it might be wise to re-examine this spec. Its current whereabouts are unknown to Edwards and myself.

Puerto Rico - Sighting(s), by McCandless on either or both 12 Oct. 1957 (as in Bond 1959) or 12 Oct. 1958 (McCandless 1961). Leopold (1963) noted several fall reports and Raffaele (1983) noted a few fall and one winter sight report. More recently, 1 or 2 inds. were observed, 22 Sept.-29 Oct. 1986 (Norton 1987) and 1 ind. was observed, 18-24 Oct. 1987 (Norton 1988). Rolle (1961a) suggested that this bird's occurrence should be considered hypothetical. CBC: 1 ind., 1974 (CR; this record must be questioned in the light of a total absence of well-documented mid-winter West Indian records).

Oporornis philadelphia - Mourning Warbler.

Puerto Rico - 1 spec., 21 March 1912 (CM; Todd 1925, Wetmore 1927, Bond 1950, Bent 1953, Leopold 1963, Biaggi 1970, Raffaele 1983). Sightings: 12 Oct. 1958 (McCandless 1961), Dec. and March (McCandless 1958); Raffaele (1983) noted these 3 sightings. CBC: 1 ind., 1977 (CR).

Vieques - Sighting, 29 Dec. 1935, in dense lowland thicket (Danforth 1937; also in Bond 1950, Leopold 1963, Sorrie 1975, American Ornithologists' Union 1983, Raffaele 1983).

Geothlypis trichas - Common Yellowthroat.

Mona - 1 spec., 1 March 1944 (UPRM). 1 ind. netted, 3 Feb. 1972 (Terborgh and Faaborg 1973 called this a new island record; also in Bond 1974, Raffaele 1973).

Puerto Rico - 11 specs.:

	day	year	mus.	nos.	ref.
Jan.	11	1943	UPRM	3	
N=3					
Feb.	21	1941	UPRM		
	22	1936	USNM		
	28	1938	USNM		
N=3					
March	1	1944	UPRM		
	5	1941	UPRM		
	12	1936	USNM		
N=3					

April 23 1977 USNM 2

N=2

Sightings: 12 Oct. 1956 (McCandless 1961), 31 Oct. (Bent 1953), 10 Dec. 1927 (Danforth 1931), 1 Jan. 1923 and 9 Jan. 1921 (Potts 1927), 5 Jan. 1930 (Danforth 1931), and 18 April 1924 (Danforth 1925, 1926, 1931, Bent 1953). The reference by Post (1978) to an observation of Geothlypis rostrata in southwestern Puerto Rico was surely of G. trichas. Listed by Gundlach (1874, 1878a, 1878b), Stahl (1882), Cory (1892), Ridgway (1902), McCandless (1958, as uncommon but regular), Leopold (1963, as rare but regular), Biaggi (1970), and Raffaele (1983, as fairly common, Oct.-April; as early as Sept. and as late as June). This species has been noted from swampy land along the seashore (Potts 1927) and from "wet grassy areas usually on the edges of freshwater swamps, ponds, or canals" (Raffaele 1983). CBC: in 10/15 CR counts, but not common.

Vieques - Sightings, 2 inds., 1 April 1971 (Sorrie 1975).

Wilsonia citrina - Hooded Warbler.

Mona - 1 ind. netted, 3 Feb. 1972 (Terborgh and Faaborg 1973; also in Bond 1974, 1978, Raffaele 1973).

Puerto Rico - 1 spec.: 11 Nov. 1942 (UPRM; Barnes 1947, Biaggi 1970). Sightings: 10 Oct.-1 Nov. (McCandless 1961), in 3 separate Decs. (McCandless 1962), and 1 Jan. 1966 (Bond 1967); inds. netted Jan. 1975, Feb. 1982, and Jan. 1984

(variously reported in Bond 1978, Faaborg and Winters 1979, Faaborg 1982, and Faaborg and Arendt 1984). Observed by Post (1978); listed by Bond (1950), McCandless (1958), Leopold (1963), and Raffaele (1983, as uncommon from Oct.-March). CBC: 1 ind. in both 1974 and 1975 (CR).

Vieques - Sighting, 31 Dec. 1962 (Bond 1968, Sorrie 1975).

Wilsonia pusilla - Wilson's Warbler.

Puerto Rico - 1 ind. was netted, 6 Jan. 1978 (Bond 1978, Faaborg and Winters 1979, Faaborg and Arendt 1984).

Wilsonia canadensis - Canada Warbler.

Puerto Rico - Sightings: 12 Oct. 1957 (Bond 1959, McCandless 1961), Dec. 1956 (McCandless 1962), perhaps in January (Biaggi 1970); Raffaele (1983) listed 2 reports from Oct. and 1 from March. Rolle (1961a) suggested considering this species' status on Puerto Rico as hypothetical.

DISCUSSION

Three warbler species breed in the region. Dendroica petechia probably does not occur, at least regularly, on Mona and the western islands, but has been documented by specimens from the coastal zone of most other islands. Dendroica adelaidae occurs on Puerto Rico and Vieques and Dendroica angelae in the highlands of Puerto Rico.

There have been 30 migrant warbler species reported from Puerto Rico, 17 from Mona, 16 from Vieques, 7 from Culebra, 3 from Cayo Santiago, and 3 from Luis Pena (Table 1). Ten species overwinter commonly: Parula americana, Dendroica tigrina, Dendroica caerulescens, Dendroica coronata, Dendroica discolor, Dendroica palmarum, Mniotilta varia, Setophaga ruticilla, Seiurus aurocapillus, and Seiurus noveboracensis. Three others, Dendroica dominica, Seiurus motacilla, and Geothlypis trichas, winter regularly but are less common. Dendroica striata occurs strictly as a fall passage migrant. Dendroica magnolia, Protonotaria citrea, and Wilsonia citrina are rare and irregular. Eight species have been reported so infrequently that their occurrence must be considered strictly accidental: Vermivora chrysoptera, Dendroica pensylvanica, Dendroica virens, Helmitheros vermivorus, Oporornis formosus, Oporornis agilis, Oporornis philadelphia, and Wilsonia pusilla. Evidence for the occurrence of the six remaining species, Vermivora pinus, Dendroica townsendi, Dendroica fusca, Dendroica pinus, Dendroica castanea, and Wilsonia canadensis is not strong enough for them to be considered as anything more than hypothetical.

Table 1. Evidence for listing of migrant warblers in the avifaunas of Puerto Rico (PR) and adjacent islands - Mona, Cayo Santiago (CS), Vieques (Vq), Luis Pena (LP), and Culebra (Cl).¹

	Mona	PR	CS	Vq	LP	Cl
Vermivora pinus		r				
Vermivora chrysoptera		r				
Parula americana	1	106	1	18	r	3
Dendroica pensylvanica		r				
Dendroica magnolia	1	?		r		
Dendroica tigrina	n	29		r		
Dendroica caerulescens	r	30		r		
Dendroica coronata	9	15		3		1
Dendroica townsendi		r				
Dendroica virens		1				
Dendroica fusca		r				
Dendroica dominica	1	5				
Dendroica pinus		r				
Dendroica discolor	8	48		10		4
Dendroica palmarum	2	17		r		
Dendroica castanea	?	r				
Dendroica striata		17				
Mniotilta varia	1	32		2		1
Setophaga ruticilla	1	32	1	2	r	2
Protonotaria citrea		r				
Helmitheros vermivorus		r				
Seiurus aurocapillus	1	35		5		1
Seiurus noveboracensis	2	41	1	2	r	3
Seiurus motacilla	?	7		4		
Oporornis formosus		r				
Oporornis agilis	?	r				
Oporornis philadelphia		1		r		
Geothlypis trichas	1	11		r		
Wilsonia citrina	n	1		r		
Wilsonia pusilla		n				
Wilsonia canadensis		r				

¹Numbers - total nos. of specimens located;

? - specimen[s] in literature (not located);

n - netting; r - sight report;

LITERATURE CITED

- Abramson, I. J., W. J. Weiss, Jr., and A. Dod. 1974. First record of Blue-winged Warbler for Hispaniola. *Amer. Birds* 28:881-882.
- American Ornithologists' Union. 1983. Check-list of North American birds. 6th ed. American Ornithologists's Union, Washington, D.C. 877 p.
- Baird, S. F. 1865. Review of American birds in the Museum of the Smithsonian Institution. Part 1, North and Middle America. *Smithsonian Misc. Coll.* 181. 449 p.
- Barnes, V, Jr. 1946. The birds of Mona Island, Puerto Rico. *Auk* 63:318-327.
- _____. 1947. Additions to the Puerto Rican avifauna with notes on little-known species. *Auk* 64:400-406.
- Beatty, H. A. 1931. Notes on birds observed at Guanica Lagoon, and its vicinity. *J. Dept. Agric. Puerto Rico* 15:19-32.
- Bello y Espinosa. 1871. Zoologische Notizen aus Puerto Rico. *Der Zoologische Garten* 12:348-351.
- Bennett, S. E. 1980. Interspecific competition and the niche of the American Redstart (Setophaga ruticilla) in wintering and breeding communities. P. 319-336 in A. Keast and E. S. Morton, eds., *Migrant birds in the Neotropics*. Smithsonian Inst., Washington, D. C.
- Bent, A. C. 1953. Life histories of North American wood warblers. *Bull. U.S. Nat. Mus.* 203:1-734.

- Biaggi, V. 1970. Las aves de Puerto Rico. Univ. Puerto Rico, Mayaguez. 371 p.
- Bond, J. 1930. The resident West Indian warblers of the genus Dendroica. Proc. Acad. Nat. Sci. Phila. 82:329-337.
- _____. 1946. The birds of Mona Island. Notulae Naturae 176:1-10.
- _____. 1950. Check-list of birds of the West Indies. 3rd ed. Wickersham Printing Co., Lancaster, Pa. 200 p.
- _____. 1959. Fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 12 p.
- _____. 1962. Seventh supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 11 p.
- _____. 1964. Ninth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 13 p.
- _____. 1966. Eleventh supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 13 p.
- _____. 1967. Twelfth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 22 p.
- _____. 1968. Thirteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 12 p.

- _____. 1970. Fifteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 15 p.
- _____. 1971. Sixteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 15 p.
- _____. 1974. Nineteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 12 p.
- _____. 1977. Twenty-first supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 16 p.
- _____. 1978. Twenty-second supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila.. 20 p.
- _____. 1979. Derivations of Lesser Antillean birds. Proc. Acad. Nat. Sci. Phila. 131:89-103.
- Bowdish, B. S. 1900. Some winter birds of the island of Vieques. Oologist 17:71-74.
- _____. 1903. Birds of Puerto Rico, part 2. Auk 20:10-23.
- Bryant, H. 1859. A list of birds from Porto Rico presented to the Smithsonian Institution, by Messrs. Robert Swift and George Latimer, with descriptions of new species or varieties. Proc. Boston Soc. Nat. Hist. 10:248-257.
- _____. 1866. Vogel von Porto Rico. J. f. Ornithologie 14:181-191.

- Cooke, W. W. 1904. Distribution and migration of North American warblers. USDA Div. Biol. Surv. Bull. 18. U. S. Dept. Agric., Washington, D. C. 142 p.
- Cory, C. B. 1886. The birds of the West Indies, including the Bahama Islands, the Greater and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Part I. Auk 3:1-59.
- _____. 1892. Catalogue of West Indian birds, containing a list of all species known to occur in the Bahama Islands, the Greater Antilles, the Caymans, and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Published by the author, Boston. 163 p.
- Cruz, A. and C. A. Delannoy. 1984a. Ecology of the Elfin Woods Warbler (Dendroica angelae). I. Distribution, habitat usage, and population densities. Carib. J. Sci. 20:89-96.
- _____ and _____. 1984b. Ecology of the Elfin Woods Warbler (Dendroica angelae). II. Feeding ecology of the Elfin Woods Warbler and associated insectivorous birds in Puerto Rico. Carib. J. Sci. 20:153-162.
- Danforth, S. T. 1922. North American migrants seen during a winter in Porto Rico. Oologist 39:176-178.
- _____. 1925. New birds for Porto Rico. Auk 42:558-563.
- _____. 1926. An ecological study of Cartagena Lagoon, Porto Rico, with special reference to the birds. J. Dept. Agric. Porto Rico 10:1-136.

- _____. 1931. Puerto Rican ornithological records. J. Dept. Agric. Porto Rico 15:33-106.
- _____. 1935. Supplementary account of the birds of the Virgin Islands, including Culebra and adjacent islets pertaining to Puerto Rico, with notes on their food habits. J. Agric. Univ. Puerto Rico 19:439-472.
- _____. 1937. Ornithological investigations in Vieques Island, Puerto Rico, during December, 1935. J. Agric. Univ. Puerto Rico 21:539-550.
- Faaborg, J. 1980. Further observations on ecological release in Mona Island birds. Auk 97:624-627.
- _____. 1982. Avian population fluctuations during drought conditions in Puerto Rico. Wilson Bull. 94:20-30.
- _____ and W. J. Arendt. 1984. Population sizes and philopatry of winter resident warblers in Puerto Rico. J. Field Ornithol. 55:376-378.
- _____ and J. E. Winters. 1979. Winter resident returns and longevity and weights of Puerto Rican birds. Bird-Banding 50:216-223.
- _____ and _____. 1980. More returns from the Guanica Forest, Puerto Rico. J. Field Ornithol. 51:368.
- Gochfeld, M. 1974. Status of the genus Vermivora (Aves, Parulidae) in the Greater Antilles with new records from Jamaica and Puerto Rico. Carib. J. Sci. 14:177-181.
- Gundlach, J. 1874. Beitrag zur ornithologie der insel Portorico. J. f. Ornithologie 22:304-315.

- _____. 1878a. Apuntes para la fauna Puerto-Riquena. Anales Soc. Esp. Hist. Nat. Madrid 7:135-234, 343-422.
- _____. 1878b. Neue beitrage zur ornithologie der insel Portorico. J. f. Ornithologie 26:157-194.
- Hellmayr, C. E. 1935. Catalogue of birds of the Americas and adjacent islands. Field Museum Nat. Hist., Zool. Ser. 13, Part 8:1-541.
- Kepler, C. B. and K. C. Parkes. 1972. A new species of warbler (Parulidae) from Puerto Rico. Auk 89:1-18.
- Leck, C. F. 1972. Observations of birds at Cecropia trees in Puerto Rico. Wilson Bull. 84:498-500.
- Leopold, N. F. 1963. Checklist of birds of Puerto Rico and the Virgin Islands. Univ. Puerto Rico Agric. Exp. Sta. Bull. 168. 119 p.
- Lowery, G. H., Jr., and B. L. Monroe, Jr. 1968. Family Parulidae. P. 3-93 in R. A. Paynter, Jr., ed., Checklist of birds of the world, Vol. 14. Harvard Univ. Press, Cambridge, Mass.
- McCandless, J. B. 1958. A field guide to the birds of Puerto Rico. I.A.U. Press, San German, Puerto Rico. 68 p.
- _____. 1961. Bird life in southwestern Puerto Rico. I. Fall migration. Carib. J. Sci. 1:3-12.
- _____. 1962. Birdlife in southwestern Puerto Rico. II. The winter season. Carib. J. Sci. 2:27-39.
- Molinares, A. 1980. A second record for Black-throated Green Warbler in Puerto Rico. Amer. Birds 34:868.

- Nolan, V., Jr. 1978. The ecology and behavior of the
Prairie Warbler Dendroica discolor. Ornithol. Monogr.
26:1-595.
- Norton, R. L. 1984. The autumn migration: West Indies
region. Amer. Birds 38:251-253.
- _____. 1985. The winter season: West Indies region. Amer.
Birds 39:353-354.
- _____. 1986. The nesting season: West Indies region. Amer.
Birds 40:1259-1260.
- _____. 1987. The autumn migration: West Indies region.
Amer. Birds 41:151-152.
- _____. 1988. The autumn migration: West Indies region.
Amer. Birds 42:142-144.
- Peters, J. L. 1927. A revision of the Golden Warbler,
Dendroica petechia (Linne). Proc. Biol. Soc. Washington
40:31-41.
- Post, W. 1978. Social and foraging behavior of warblers
wintering in Puerto Rican coastal scrub. Wilson Bull.
90:197-214.
- Potts, F. A. 1927. Notes on Porto Rican birds. Auk 44:120-
121.
- _____. 1948. Notes on two species in Puerto Rico. Auk
65:458.
- Raffaele, H. A. 1973. Assessment of Mona Island avifauna.
P. 1-32 in Junta de Calidad Ambiental de Puerto Rico.
Isla Mona, Vol. 2, Apendice K.

- _____. 1983. A guide to the birds of Puerto Rico and the Virgin Islands. Fondo Educativo Interamericano, San Juan. 255 p.
- Recher, H. F. and J. T. Recher. 1966. A contribution to the knowledge of the avifauna of the Sierra de Luquillo, Puerto Rico. *Carib. J. Sci.* 6:151-161.
- Ridgway, R. 1902. The birds of North and Middle America. Part II. *Bull. U.S. Nat. Mus.* 50:1-834.
- Rolle, F. J. 1961a. Notes and records of little-known species of birds from Puerto Rico. *J. Agric. Univ. Puerto Rico* 45:333-341.
- _____. 1961b. The avifauna of Mona Island, Puerto Rico. *Fla. Nat.* 34:195-202.
- Salvin, O. and F. D. Godman. 1881. *Biologia Centrali-Americana. Aves. Vol. I.* Taylor and Francis, London. 512 p.
- Schmidt, K. P. 1926. The amphibians and reptiles of Mona Island, West Indies. *Field Mus. Nat. Hist., Zool. Ser.* 12:147-163.
- Schwartz, A. and R. F. Klinikowski. 1963. Observations on West Indian birds. *Proc. Acad. Nat. Sci. Phila.* 115:53-77.
- Sharpe, R. B. 1885. *Catalogue of birds in the British Museum. Vol. 10.* The British Museum, London. 682 p.
- Sorrie, B. A. 1975. Observations on the birds of Vieques Island, Puerto Rico. *Carib. J. Sci.* 15:89-103.

- Spaulding, N. G. 1937. Some observations on the nesting habits of Adelaide's Warbler. J. Agric. Univ. Puerto Rico 21:559-566.
- Stahl, A. 1882. Catalogo de Gabinete Zoologica. Parte Primera. Clasificacion sistematica de la fauna puertorriquena por medio de cuadros sinopticos. Imprenta por Boletin Mercantil, Puerto Rico.
- _____ 1887. Beitrag zur Vogelfauna von Portorico. Ornith 3:448-453.
- Struthers, P. H. 1923. Observations on the bird life of Porto Rico. Auk 40:469-478.
- Taylor, E. C. 1864. Five months in the West Indies. Part II - Martinique, Dominica, and Porto Rico. Ibis 6:157-173.
- Terborgh, J. and J. Faaborg. 1973. Turnover and ecological release in the avifauna of Mona Island, Puerto Rico. Auk 90:759-779.
- Todd, W. E. C. 1925. Two new birds for Porto Rico. Auk 42:282.
- Wetmore, A. 1916a. Birds of Porto Rico. U. S. Dept. Agric. Bull. 326.
- _____. 1916b. The birds of Vieques Island, Porto Rico. Auk 33:403-419.
- _____. 1917. The birds of Culebra Island, Porto Rico. Auk 34:51-62.

- _____. 1927. The birds of Porto Rico and the Virgin Islands. Psittaciformes to Passeriformes. Sci. Survey Porto Rico and Virgin Islands 9:407-571.
- Willis, E. O. 1973. Local distribution of mixed flocks in Puerto Rico. Wilson Bull. 85:75-77.

A DISTRIBUTIONAL ANALYSIS OF THE
WARBLERS OF THE WEST INDIES

Volume 2

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Forestry, Wildlife, and Fisheries

by
David Neal Pashley
B.S., Humboldt State University, 1974
December 1988

WARBLERS OF THE WEST INDIES

VII. JAMAICA

This is the seventh paper in a series documenting the distribution and natural history of wood-warblers (Emberizidae:Parulinae) in the West Indies. Data sources have been the specimens housed in museum collections and published literature.

The following is a list of the abbreviations of the museums mentioned in the text.

- AMNH - American Museum of Natural History
- ANSP - Academy of Natural Science of Philadelphia
- BMNH - British Museum (Natural History)
- CM - Carnegie Museum of Natural History
- COR - Cornell University
- DNHM - Delaware Natural History Museum
- FM - Field Museum of Natural History
- LSU - Louisiana State University Museum of Zoology
- MCZ - Museum of Comparative Zoology, Harvard
- MVZ - Museum of Vertebrate Zoology, Berkeley
- ROM - Royal Ontario Museum
- USNM - United States National Museum

Results of the one Christmas Bird Count (CBC) held on Jamaica (Trelawney, 1977) are included.

March (1863) commented on the occurrence of many warbler species on Jamaica during summer months in which there are otherwise few or no reports from the West Indies. One or more of his sons seemed to be the source of much of the questionable information. Not only did March claim that many of these birds bred, but he sent specimens (and in one case apparently an alleged nest) to the USNM bearing mid-summer dates. In retrospect, these data must be considered questionable. In the following tables, those specimens are listed with asterisks in the undated sections.

SPECIES ACCOUNTS

Vermivora pinus - Blue-winged Warbler.

Sightings: 24 Jan. 1965 (in mangroves, Gochfeld 1974; also in Bond 1965) and late Feb. (Bond 1971). 1 ind. netted, 21 Oct. 1965 (Gochfeld 1974).

Vermivora chrysoptera - Golden-winged Warbler.

Sighting, 19 Dec. 1964 (Bond 1965, Gochfeld 1974).

Vermivora peregrina - Tennessee Warbler.

Gochfeld (1974) reported at least 14 inds. banded and 4 sightings in various months and years. Diamond and Smith (1973) and Diamond et al. (1977) were responsible for some (if not all) of the netting records. Nov., Dec., Feb., and March sightings were noted by Bond (1964, 1965). Lack

(1976) wrote that this species "is regular in small numbers in both lowland riverine woodland and montane forest."

[Vermivora celata - Orange-crowned Warbler.]

Bond (1967) considered a Jamaica report questionable.

Vermivora ruficapilla - Nashville Warbler.

Sighting, 14 April 1971 (Bond 1972, Gochfeld 1974).

Parula americana - Northern Parula.

72 specs.:

	day	year	mus.	nos.	ref
Oct.	29	1907	AMNH	3	
	?	1863	AMNH		

N=4

Nov.	4-21	1907	AMNH	6	
	6	1861	USNM		b
	29	1890	MCZ		c
	?	1863	AMNH		

N=9

Dec.	1-18	1890	MCZ	9	c
	"	"	FM	3	c
	12	1907	AMNH		
	26	1919	AMNH		

N=14

Jan.	2-31	1891	MCZ	11	c
	"	"	FM	4	c

21 1908 AMNH

30 1893 AMNH

N=17

Feb. 2-16 1891 FM 8 c

" " MCZ 5 c

11 1904 BMNH

? 1865 USNM

" " MCZ

N=16

March 7,8 1905 BMNH 2

? 1863 AMNH 3

N=5

April ? 1891 ROM

" " AMNH

N=2

undated ? ? BMNH 5 a

N=5

a - Sclater 1861

b - Baird 1865

c - Scott 1893

Lack and Lack (1972) considered this species very common in dry, limestone forest and other rich damp, secondary woodlands in the lowlands; it is less common at higher elevations (also in Lack 1976). Gosse (1847) considered it one of the most common warblers, with extreme dates of early Sept. and 20 April. Sighting, 17 Aug. (Norton 1983). Nine of the 17 netted by Diamond et al.

(1977) were recaptured (maximum interval - 25 months)
 (Diamond and Smith 1973, Loftin 1977). Observed by March
 (1863), Ventura (1969), and Cruz (1972). Listed by Denny
 (1847), Albrecht (1862), Sclater (1862), Newton and Newton
 (1881), Sharpe (1885), Cory (1892), and Hellmayr (1935).
 Reported in 1977 CBC.

Dendroica petechia eoa - Yellow Warbler.

81 specs.:

	day	year	mus.	nos.	ref
July	3-24	1961	LSU	4	
N=4					
Aug.	2	1961	LSU	2	
	6	1963	MVZ		
	10, 13	1926	USNM	2	f
	28	1861	USNM		bc
N=6					
Sept.	11	1905	BMNH		
N=1					
Oct.	7	1884	BMNH		
	29	1907	AMNH	3	
N=4					
Nov.	8-28	1907	AMNH	7	
	22-27	1865	USNM	3	
	"	"	AMNH		
	"	"	ANSP		
	"	"	BMNH		

	"	"	MCZ		
N=14					
Dec.	2	1907	AMNH		
	26	1902	BMNH		
N=2					
Jan.	4	1905	BMNH		
	21	1824	BMNH		ad
	?	?	BMNH		ad
N=3					
Feb.	9, ?	1866	AMNH		
	"	"	USNM		
	11, 14	1904	BMNH	2	
	13-23	1906	MCZ	12	
	"	"	CM		
	?	1907	AMNH	2	
N=19					
March	4	1920	AMNH	2	
	5	1904	BMNH	5	e
	6	1905	BMNH	2	
	17	1906	MCZ	2	
	31	1895	AMNH		
	?	1863	AMNH	2	
N=14					
April	1	1859	USNM		bc
	23	1961	LSU		
N=2					

May	12	1859	BMNH	b
	?	1891	AMNH	

N=2

June	10	1862	USNM	
	16	1961	LSU	2
	?	1812	USNM	

N=4

undated	?	?	BMNH	4	a?
	?	?	USNM	2	

N=6

- a - Gosse 1847
- b - Sclater 1861, 1862
- c - Baird 1865
- d - Scott 1893
- e - Nicoll 1904
- f - Danforth 1928

Additional specs. (not located): 5 from Aug. of 1858, 1861, and 1862 (Baird 1865). Gosse (1847) described Sylvicola eoa, the Aurora Warbler, on the basis of 2 specs. collected 21 and 24 Jan. 1824. These inds. were young Yellow Warblers, and Gosse published a plate of what he thought an adult would look like. Newton and Newton (1881) wrote that "no specimen has been obtained since Mr. Gosse's time, and it has been suggested that his bird was the young of some other species." Sharpe (1885) indicated that the type specs. had been on display and had become discolored and faded, but that nonetheless he could not imagine either

one possessing the extent of rufous coloration in Gosse's plate. As Peters (1927) pointed out, the plate corresponds to neither Gosse's description nor the types; due to the plate, however, ornithologists looked for this "rare" species for 75 years. In the meantime, Sclater (1861) noted that 3 specs. that he received labelled Sylvicola eoa after Gosse were clearly Yellow Warblers. D. petechia was described as a species on the basis of a plate depicting one of the West Indian races, but labelled from Pennsylvania. It was thought for quite some time after Sclater noted Yellow Warblers from Jamaica that this was the race pictured. As a result, Jamaican birds were designated D. p. petechia. Peters (1927) not only pointed out that the Aurora Warbler was a Yellow Warbler, but also that the plate of the type was of a bird from Barbados. As Barbados birds became D. p. petechia that name was lost for Jamaican birds. As eoa was the first published name of Jamaican birds that eventually came to be known as Yellow Warblers, they (as well as those from the Cayman Islands) became D. p. eoa. Gosse (1847) also referred to several specs. of Sylvicola aestiva collected "very near the sea" and indicated, curiously, that they arrive in Sept. and depart in April. March (1863) commented that Yellow Warblers are rarely seen far from the sea, that they nest in mangroves, and that clutch size is 3 or 4. Field (1894) considered them common in mangroves, where their breeding season begins in May. Danforth (1928) found them "common near the sea, especially

in mangroves." Lack and Lack (1972) felt that it was "almost confined in winter to the mangroves and woodland close to shore; occurs sparsely in the immediately adjoining forest. In April, when the wintering warblers leave, it broadens its habitats by moving into marsh forest and riverine woodland." This was reiterated by Lack (1976). Listed by Albrecht (1862), Newton and Newton (1881), Cory (1892), Ridgway (1902), and Hellmayr (1935). 4 inds. reported in 1977 CBC.

Dendroica pensylvanica - Chestnut-sided Warbler.

2 specs. (neither located): 16 Oct. 1965 (Bond 1966) and 7 Dec. (Bond 1972). Moreno (1940), in noting this species on Cuba, reported that it had been seen on Jamaica. Listed by Bond (1950). An ind. banded by Diamond and Smith (1973) was incorrectly claimed as a new island record.

Dendroica magnolia - Magnolia Warbler.

This species was listed by Denny (1847) and then not again until Tordoff (1952) reported a spec. (not located) collected 25 Feb. 1947 and subsequent sightings on 15 and 18 Feb. 1949 and 8 Nov. 1948. Lack and Lack (1972) wrote that this species is "rather scarce, encountered mostly in rich lowland forest." Lack (1976) noted that it forages rather low in tall trees with thin broad leaves. Observed by Cruz (1972) and netted by Diamond et al. (1977).

Dendroica tigrina - Cape May Warbler.

44 specs.:

	day	year	mus.	nos.	ref
Oct.	29	1879	BMNH		
	?	1861	AMNH	2	
	?	1913	AMNH		
N=4					
Nov.	11	1907	AMNH		
	?	1863	AMNH	2	
N=3					
Dec.	11	1907	AMNH		
	26	1919	AMNH		
	29	1890	FM		e
	"	"	MCZ		e
	?	1861	USNM		
N=5					
Jan.	2-30	1891	MCZ	7	e
	"	"	FM	3	e
N=10					
Feb.	13,20	1906	MCZ	2	
	?	1865	MCZ	2	
	"	"	USNM		
N=5					
March	12	1859	BMNH		abd
	25,26	1894	AMNH	2	
	?	1863	AMNH	3	
	?	1866	MCZ		

	?	1905	BMNH		
	?	?	MCZ		
N=9					
April	1	1859	BMNH		abd
	?	1891	AMNH		
N=2					
undated	*	1863	USNM	2	c
	?	?	BMNH	4	d

N=6

- a - Sclater 1861
- b - Albrecht 1862
- c - Baird 1865
- d - Sharpe 1885
- e - Scott 1893

Additional spec. (not located), Nov. 1860 (Baird 1865; also noted were questionably dated June 1862 and June 1863 specs.). The undated specs. in the BMNH may include those that Gosse (1847) noted collecting. Sclater (1861; repeated by Albrecht 1862) noted specs. from 12 March 1832 [probably the spec. above from that date in 1859] and 12 April [probably the 1 April 1859 spec. above]. Lack and Lack (1972) wrote that this species resides "mainly in parkland and on the edges of woodland," that it eats more fruit and nectar (it often visits hummingbird feeders) than other warblers as well as sucking sap from holes drilled by Yellow-bellied Sapsuckers (Sphyrapicus varius), and that its repeated pecking at small leaves suggests "that it takes

extremely small, plentiful insects." Lack (1976) noted that it often occurs in areas partly cleared by humans. March (1863) wrote that "specimens of the nest and eggs have been sent to the Smithsonian Institution" (I know of no material thus identified). Ridgway (1902) termed this species "resident in Jamaica, and said to breed on high mountains of that island!" Bond (1930) felt that nesting claims have never received confirmation and may well be ignored. Diamond et al. (1977) netted 13 inds. Listed by Sloane (1725; his "small Yellow and Brown Bird" seems to be this species), Newton and Newton (1881), Cory (1892), Hellmayr (1935), and Cruz (1972).

Dendroica caerulescens - Black-throated Blue Warbler.

34 specs.:

	day	year	mus.	nos.	ref
Oct.	11,26	1907	AMNH	3	
N=3					
Nov.	4	1907	AMNH		
	29	1890	FM		c
N=2					
Dec.	2-13	1890	MCZ	2	c
	"	"	FM		c
	3-30	1907	AMNH	4	
	"	"	MCZ		
	23,?	1861	FM		
	"	"	USNM		

	26	1919	AMNH		
	?	1906	AMNH		
N=12					
Jan.	16,20	1891	MCZ	2	c
	29	1859	USNM		
N=3					
Feb.	6	1907	AMNH		
	26	1920	AMNH		
	?	1865	MCZ		
N=3					
March	17	1865	USNM		
	?	1881	FM		
N=2					
April	14,15	1978	USNM	2	
	29	1972	ROM		
N=3					
undated	?	1876	BMNH		
	?	?	BMNH	5	ab
N=6					

a - Gosse 1847

b - Sclater 1861

c - Scott 1893

Additional specs. (not located): 20 Dec. 1859 and 23 Dec. 1860 (Baird 1865). One of the undated BMNH specs. above is the type for Sylvicola pannosa. Gosse (1847) described this on the basis of a female D. caerulescens collected 8 Oct.; he wrote that this may have been a female

of a known species and Sclater (1861) confirmed that such was the case (also in Newton and Newton 1881). Lack and Lack (1972) wrote that this species is "recorded commonly in rich lowland forest, mid-elevation and montane forest, and in cultivated woodland; absent from the arid lowland forest." Lack (1976) added that it usually feeds by taking insects off broad, thick-leaved forest trees. Sightings: 19 June (Bond 1969), 29 July 1972 (Bond 1973), a later 29 July (Bond 1980), and 15 May (Bond 1969). Diamond et al. (1977) netted 26 inds. from Oct. to May; 9 of these were recaptured (maximum interval - 36 months) (Diamond and Smith 1973, Loftin 1977). A male D. c. cairnsi was banded on 26 Nov. 1955 (Bond 1957); all other reports are presumably of the nominate subspecies. Observed by March (1863), Ventura (1969), Cruz (1972), and Gochfeld (1985). Listed by Denny (1847), Albrecht (1862), Newton and Newton (1881), Salvin and Godman (1881), Sharpe (1885), Cory (1892), Ridgway (1902), and Hellmayr (1935). Reported in 1977 CBC.

Dendroica coronata - Yellow-rumped Warbler.

13 specs.:

	day	year	mus.	nos.	ref
Dec.	23	1904	AMNH		
	26	1890	MCZ		
	?	1859	BMNH		a

N=3

Jan.	1-30	1891	FM	4
	21	1908	AMNH	2

N=6

Feb.	1	1879	BMNH	
	11	1891	MCZ	

N=2

April	4	1865	USNM	
	4	1886	USNM	

N=2

a - Sclater 1862

Additional specs. (not located) from Oct. and Jan. (Gosse 1847). March (1863) and Baird (1865) noted a questionable 11 June 1863 spec. Gosse (1847) wrote that this species arrives rather late in autumn and that he observed them to be common only once (in late March). Scott (1893) observed them throughout the winter in small flocks. Lack and Lack (1972) had no records earlier than 10 Jan. and noted that, although in some years it is a common transient, very few stay for the winter (also in Lack 1976). Gochfeld (1985) observed them commonly in pines at 1200 m from Nov.-Jan., but noted large apparent inter-year differences in abundance. March (1863) and Cooke (1904) alluded to breeding on the island without supportive evidence. Listed by Denny (1847), Albrecht (1862), Newton and Newton (1881), Salvin and Godman (1881), Sharpe (1885), Cory (1892), Ridgway (1902), and Hellmayr (1935).

Dendroica virens - Black-throated Green Warbler.

1 spec., 5 Feb. 1879 (BMNH; Newton 1879 displayed this skin to the Zoological Society of London). Listed thereafter by Newton and Newton (1881), Salvin and Godman (1881), Cory (1892), Scott (1893), and Cooke (1904). Tordoff (1952) referred to another spec. taken 12 Feb. 1947. Lack and Lack (1972) wrote that it "occurs regularly in woodland at all altitudes." Lack (1976) pointed out its use of introduced conifers and low to mid-level arid forest. Cruz (1972) considered it uncommon to fairly common and Diamond et al. (1977) netted 9 inds. over several seasons.

Dendroica fusca - Blackburnian Warbler.

Sighting, 4 May 1964 (Bond 1968). 1 ind. netted (Diamond et al. 1977, no details).

Dendroica dominica - Yellow-throated Warbler.

82 specs.:

	day	year	mus.	nos.	ref
Sept.	5	1893	AMNH		
	14	1905	BMNH	2	
N=3					
Oct.	20-29	1907	AMNH	2	
	"	"	MCZ		

N=3

Nov.	4-23	1907	AMNH	4	
	?	1863	AMNH		
N=5					
Dec.	2	1907	AMNH		
	6-31	1890	MCZ	9	c
	"	"	FM	2	c
	9-26	1891	MCZ	2	
	"	"	MVZ		
	22,26	1919	AMNH	2	
	26	1902	BMNH		
N=18					
Jan.	1-26	1891	MCZ	21	c
	"	"	FM	9	c
	"	"	ANSP		c
	"	"	MVZ		c
	?	1866	USNM		
N=33					
Feb.	2-14	1891	MCZ	7	c
	"	"	FM	2	c
	3	1890	ROM		
	6	1865	MCZ	2	
	16	1904	BMNH		
	?	1865	USNM		
	?	1866	USNM		
N=15					
undated	*	1862	FM		a
	?	1876	BMNH		

?	?	BMNH	2	b
?	?	USNM		

N=5

- a - Baird 1865
- b - Sharpe 1885
- c - Scott 1893

Additional spec. (not located): Nov. 1861 (Baird 1865). It is "found regularly in small numbers in introduced pines in both lowlands and mountains" (Lack and Lack 1972). Lack (1976) noted that early records indicate that the bird occurred before pines were introduced and that it had been observed foraging in bromeliads; it now largely specializes on pines, however. Gosse (1847) considered it one of the earliest warblers because of a 16 Aug. sighting (an early fall date in Bent 1953). Scott (1893) took this date to mean that the species bred on the island. March (1863) observed an adult with 2 young on 8 Aug. 1862 and felt that "the young birds were evidently too young and weak to have crossed the sea." As usual with March, this cannot be taken as credible testimony. Observed by Gochfeld (1985); 2 inds. netted by Diamond et al. (1977). Listed by Denny (1847), Albrecht (1862), Sclater (1862), Newton and Newton (1881), Cory (1892), Ridgway (1902), and Hellmayr (1935).

[Dendroica pinus - Pine Warbler.]

Bond (1972) considered reports from 18 Oct. and 15 April questionable. Diamond and Smith (1973) reported that

an ind. they had netted was a new island record (also in Diamond et al. 1977). Bond (1978) noted that because the netted bird was not collected and no diagnostic details given, it was impossible to tell if it was of the North American mainland or Hispaniolan subspecies [or Bahaman]; he also commented that this could be an improperly identified Dendroica striata.

Dendroica discolor - Prairie Warbler.

66 specs.:

	day	year	mus.	nos.	ref
Aug.	31	1859	USNM		
N=1					
Sept.	14	1905	BMNH	3	
N=3					
Oct.	25-29	1907	AMNH	4	
N=4					
Nov.	8	1878	BMNH		
	8-29	1890	ANSP		
	"	"	MCZ		
	"	"	FM		
	8-30	1907	AMNH	7	
	?	1863	AMNH	2	
N=13					
Dec.	1-22	1890	MCZ	3	c
	"	"	FM	2	c
	"	"	ANSP		c

	11	1907	AMNH		
	30	1891	MCZ		
	?	1863	AMNH		
N=9					
Jan.	2-31	1891	MCZ	12	c
	"	"	ANSP		c
	"	"	FM		c
N=14					
Feb.	4	1907	AMNH		
	6-14	1891	FM	3	c
	"	"	MCZ		c
	11-15	1904	BMNH	3	
	?	1865	BMNH		b
	"	"	MCZ		
N=10					
March	5	1904	BMNH	3	d
	5	1907	AMNH		
	7,10	1905	BMNH	2	
	?	1863	BMNH		
N=7					
undated	*	1862	USNM		a
	?	1876	BMNH		
	?	1878	FM		
	?	?	BMNH		
	?	?	USNM		
N=5					

- a - Baird 1865
- b - Sharpe 1885
- c - Scott 1893
- d - Nicoll 1904

Additional specs. (not located): 2 from 18 Aug. and more than 1 on 2 Jan. (Gosse 1847); Sclater (1861) referred to 3 specs. collected in Jan. and Aug, probably those of Gosse; and 1 ind. from 10 Jan. 1857 (Baird 1865). Gosse (1847) noted 18 Aug. and 11 April as extreme dates. This species was "found in numbers during the entire year" according to March (1863); Scott (1893) found them to be rather common (and guessed on the basis of Gosse's Aug. date that some probably breed. Lack and Lack (1972) considered them "the commonest leaf-gleaner in all types of lowland forest except good secondary forest; occurs especially in the more open areas and places where scrubby mimosaceous trees predominate." The same points were stressed by Lack (1976). Diamond et al. (1977) netted 35 inds. between late Aug. and April; 3 of these were recaptured (maximum interval - 61 months) (Diamond and Smith 1973, Loftin 1977). Listed by Denny (1847), Albrecht (1862), Sclater (1862), Newton and Newton (1881), Cory (1892), Ridgway (1902), and Hellmayr (1935). 2 inds. reported in 1977 CBC.

Dendroica palmarum - Palm Warbler.

20 specs.:

	day	year	mus.	nos.	ref
Nov.	1	1859	BMNH		a
	24	1907	AMNH		
N=2					
Dec.	30	1890	FM	2	c
	?	1865	USNM		
N=3					
Jan.	9-31	1891	FM	7	c
	"	"	MCZ		c
	16	1895	FM		
N=9					
Feb.	4	1858	BMNH		
	6	?	MCZ		
	9	1891	FM		c
N=3					
March	4	1932	FM		
N=1					
April	6	1859	BMNH		ab
N=1					
undated	?	?	BMNH		a

N=1

a - Sclater 1861

b - Albrecht 1862

c - Scott 1893

Additional spec. (not located), 4 April 1879 (Ridgway 1902). Lack and Lack (1972) wrote that it "occurs in Jamaica mainly in the man-modified habitat of grassland with scattered trees and at the forest edge, chiefly in the lowlands" and that this is "the only warbler in Jamaica which feeds primarily on grassy ground in the open." Bond (1957) questioned sight reports of D. p. hypochrysea (Scott 1893, Hellmayr 1935) due to difficulties in identification in the field. It occurs "chiefly in the lowlands, in open grasslands with scattered trees" (Lack 1976). Bond (1957) also was "unwilling to accept" a sighting on 28 Aug. 1955 because it was too early for this species. Bond (1966) reported an equally unlikely 6 Sept. sighting without comment. Diamond et al. (1977) netted 3 inds. Listed by Newton and Newton (1881), Sharpe (1885), Cory (1892), Ridgway (1902), Hellmayr (1935), and Ventura (1969).

[Dendroica castanea - Bay-breasted Warbler.]

Sightings: 7 May 1950 (Bond 1951) and 29 Nov. (Bond 1966).

Dendroica striata - Blackpoll Warbler.

1 spec., undated (BMNH; Sclater 1862, Sharpe 1885). Listed on that basis by Newton and Newton (1881), Cory (1892), Scott (1893), and Ridgway (1902). Bond (1968) "considered questionable" a sight report on 15 Feb. 1967. An ind. was netted, 22 March 1969 (Bond 1970, probably the

same occurrence noted by Diamond et al. 1977). Cruz (1972) considered this an uncommon spring transient. 1 ind. reported, questionably, in 1977 CBC.

Dendroica pharetra - Arrow-headed Warbler.

51 specs.:

	day	year	mus.	nos.	ref
July	1	1904	COR		
	30	1926	USNM		f
N=2					
Aug.	21	1926	USNM		f
	23	1883	FM		
	24	1859	USNM		bc
	?	1895	AMNH		
N=4					
Oct.	1	1879	BMNH		de
	4-14	1907	AMNH	5	
	11	1883	FM		
	31	1980	LSU	3	
N=10					
Nov.	1	1980	LSU		
N=1					
Dec.	10,11	1907	AMNH	3	
N=3					
Feb.	5	1949	DNMH		
	29	1920	AMNH		
N=2					

March	13	1930	ANSP		
	17	1882	AMNH	2	
N=3					
April	6-14	1978	USNM	5	
	29,30	1972	ROM	3	
	?	1859	USNM		b
N=9					
May	6-26	1879	BMNH	4	de
	"	"	USNM	2	
	7	1971	ROM		
	25	1881	MCZ		
N=8					
June	11	1883	FM		
	29	1904	COR		
N=2					
undated	?	1859	BMNH		b
	?	?	BMNH	4	ae
	?	?	FM		
	?	?	USNM		c

N=7

- a - Gosse 1847
- b - Sclater 1861, 1862
- c - Baird 1865
- d - Newton 1879
- e - Sharpe 1885
- f - Danforth 1928

This species was described as Sylvicola pharetra by Gosse (1847) on the basis of a spec. collected 9 Feb. (one of the undated BMNH specs. above). Sclater (1861) placed it in Dendroica. Danforth (1928) found it foraging never more than 3 m above the ground in wooded valleys. Bond (1930) reported it from the "undergrowth of the virgin forest and the dense second growth of the Jamaica hills or mountains." Bond (1944), summarizing knowledge of the species, wrote that it ranges widely through the higher parts of Jamaica, but is rare except in the Blue Mountains, where it is fairly common. Lack and Lack (1972) noted that it "breeds commonly in montane forest and regularly in mid-elevation forest" and that it feeds on insects from leaves usually fairly high above the ground. Lack (1976) indicated that birds may become more common at lower elevations in winter (even to sea-level in one case), but that it is never found outside of wet forest. Cruz (1980) found it in both open and dense wet limestone forest (but not in wooded pastures), where it foraged for insects and some fruits in middle and upper outer branches of the canopy (foraging height - 6-9 m). Listed by Albrecht (1862), Newton and Newton (1881), Cory (1886, 1892), Scott (1893), Ridgway (1902), Hellmayr (1935), and Cruz (1972). 9 inds. reported in 1977 CBC.

Mniotilta varia - Black-and-white Warbler.

36 specs.:

	day	year	mus.	nos.	ref
Oct.	15,16	1907	AMNH	2	
N=2					
Nov.	4	1861	USNM		b
N=1					
Dec.	6-28	1890	FM	2	
	"	"	MCZ		
	9	1907	AMNH		
N=4					
Jan.	7-19	1891	ANSP	2	
	"	"	MCZ		
	13	1859	USNM		b
	28	1893	FM		
	"	"	ROM		
N=6					
Feb.	5	1907	AMNH		
	6	1860	AMNH		
	15	1904	BMNH		
	?	1865	MCZ		
	?	1866	USNM	3	
N=7					
March	3,5	1904	BMNH	2	c
	12	1907	AMNH		
	?	1863	AMNH	2	

	?	1865	USNM		
N=6					
April	4	1893	AMNH		
	15,17	1978	USNM	2	
N=3					
undated	?	?	BMNH	7	a?

N=7

a - Sclater 1861

b - Baird 1865

c - Nicoll 1904

Sclater (1861) referred to a Jan. spec., presumably among the undated specs. in the BMNH, and later noted 2 specs. in his personal collection (Sclater 1862). Lack and Lack (1972) considered this species common "in all types of natural forest, both open and closed, from mangroves and the most arid lowland forest to the wettest and highest montane forest and also in cultivated forest, including introduced pines." This was reiterated in general by Lack (1976). Noted by Gosse (1847) as rather common in winter with extreme dates of 26 Sept. and 30 April. Also observed by March (1863), Scott (1893, as not uncommon in Dec. and Jan.), Ventura (1969), and Cruz (1972). 44 inds. were netted from early Sept.-May (Diamond 1973, Diamond et al. 1977); 10 of these were recaptured (maximum interval - 25 months) (Diamond and Smith 1973, Loftin 1977). Listed by Sloane (1725, as "the small black and white Bird" - the written description applied to either this species or the

Arrow-headed Warbler), Denny (1847), Albrecht (1862), Newton and Newton (1881), Sharpe (1885), Cory (1892), and Hellmayr (1935). 10 inds. reported in 1977 CBC.

Setophaga ruticilla - American Redstart.

43 specs.:

	day	year	mus.	nos.	ref
Aug.	5	1907	AMNH		
	30	1861	BMNH	2	ac
N=3					
Sept.	5,10	1858	USNM	2	
	?	1861	USNM		b
N=3					
Oct.	14	1907	AMNH		
N=1					
Nov.	9,16	1904	AMNH	2	
	11-28	1907	AMNH	6	
	28	1890	MCZ		d
N=9					
Dec.	1	1890	FM		d
	10	1907	AMNH		
	15	1890	MCZ		d
	26	1902	BMNH		
N=4					
Jan.	1-28	1891	MCZ	9	d
	"	"	FM	2	
N=11					

Feb.	14	1865	USNM		
	?	1864	AMNH	2	
	?	1865	MCZ	3	
N=6					
March	5	1904	BMNH		e
	?	1863	AMNH		
N=2					
April	?	1905	BMNH		
N=1					
undated	?	?	BMNH	2	a
	?	?	MCZ		

N=3

a - Sclater 1861

b - Baird 1865

c - Sharpe 1885

d - Scott 1893

e - Nicoll 1904

Additional specs. (not located): 10 Aug. (Gosse 1847; the earliest northern migrant that he saw; an early date in Bent 1953) and 20 Nov. 1858 (Baird 1865). The earliness of the former date prompted Scott (1893) to suggest (incorrectly) that it breeds on Jamaica. March (1863) observed 3 inds., 16 Aug. 1862, and commented that this species is often seen in summer in the mountains; as usual, March's data cannot be considered reliable. Sighting, 16 Aug. 1982 (Norton 1983). This species is found "in all types of natural woodland, particularly mangroves, sea-level

forests, and lowland riverine forest; scarce in the mountains" (Lack and Lack 1972). Lack (1976) wrote that this is "the only warbler in Jamaica which takes almost all its insect prey from the air." 49 inds. were netted from late Aug.-mid-May (Diamond 1973, Diamond et al. 1977), including at least 15 that were recaptured (maximum interval - 37 months) (Diamond and Smith 1973, Loftin 1977). Observed by Ventura (1969) and Cruz (1972). Listed by Sloane (1725, as "the small Black and Orange-colour'd Bird", probably this species), Denny (1847), Albrecht (1862), Newton and Newton (1881), Salvin and Godman (1881), Cory (1892), and Hellmayr (1935). 2 inds. reported in 1977 CBC.

Protonotaria citrea - Prothonotary Warbler.

Sightings: 28 Feb. 1928 (Baker 1930, also in Bent 1953), 20 Sept. (Bond 1965), and 8 Jan. (Bond 1969).

Helmitheros vermivorus - Worm-eating Warbler.

10 specs.:

	day	year	mus.	nos.	ref
Oct.	15	1907	AMNH		
N=1					
Nov.	4	1907	AMNH		
N=1					
Dec.	1	1896	FM		
	16	1890	MCZ		b
N=2					

Jan.	8,17	1891	MCZ	2	b
------	------	------	-----	---	---

N=2

Feb.	6	1907	AMNH		
------	---	------	------	--	--

	?	1865	MCZ		
--	---	------	-----	--	--

N=2

March	5	1907	AMNH		
-------	---	------	------	--	--

N=1

undated	?	1853	BMNH		a
---------	---	------	------	--	---

N=1

a - Sclater 1862

b - Scott 1893

Additional specs. (not located): 1 and 13 Dec. 1890 (Scott 1893) and 3 inds. from 23 Dec. 1946-2 Feb. 1947 (Tordoff 1952 also saw 4 other inds. in this period). Gosse (1847) saw 3 or 4 inds. in diverse habitats as early as 7 Oct. Lack and Lack (1972) wrote that it "occurs in Jamaica in all types of natural forest, except mangroves, and in cultivated forest with rather thick cover." They also noted that many more were captured in mist-nets than would be expected based upon observation. Lack (1976) wrote that this is "the only species which feeds primarily by probing among clusters of dead hanging leaves, and also on dead twigs, in which it sometimes excavates or pulls off bark." Diamond et al. (1977) had banded a total of 37 inds. from late Sept. to April. At least 14 of these were recaptured, including 1 after an interval of 64 months (Diamond and Smith 1973, Loftin 1977). Observed by Ventura (1969) and

Cruz (1972, noted as uncommon). Listed by Sloane (1725, as "The Worm-Eater"), Albrecht (1862), March (1863), Newton and Newton (1881), Sharpe (1885), Cory (1886, 1892), Ridgway (1902), Cooke (1904), and Hellmayr (1935). 2 inds. reported in 1977 CBC.

Limnothlypis swainsonii - Swainson's Warbler.

5 specs.:

	day	year	mus.	nos.	ref
Oct.	28	1882	BMNH		
N=1					
Nov.	26	1907	AMNH		
N=1					
Jan.	12	1884	BMNH		
N=1					
March	16	1882	BMNH		ab
N=1					
April	14	1978	USNM		
N=1					

a - Bond 1942

b - Merriam 1885

Additional specs. (not located): 8 Feb. 1879 (Newton 1879); Merriam (1885) noted the spec. that Newton had displayed as well as 7 others: 1 is in the above list; the others are dated 18 Feb., 8 April, 1 and 7 Oct. 1879, and 21 Dec. 1881 (Sharpe 1885 examined some of these specs.; also in Meanley 1971); 31 Dec. 1946 and 5 and 7 Feb. 1947

(Tordoff 1952 collected these and observed at least 9 others between those dates in both dry lowland and damp upland forest; also in Meanley 1971). Lack and Lack (1972) indicated that this bird feeds on the forest floor in leaf litter and that it may be more common than thought due to its wariness and the thick vegetation it inhabits. It is "regular in lowland woods and montane forest with thick undergrowth" (Lack 1976). 18 inds. have been banded (Diamond et al. 1977); 4 were recaptured at a maximum interval of 87 months (Diamond and Smith 1973, Loftin 1977; the 12 banded that Bond 1965 referred to may have been from this group). Sighting, 9 Sept. (Bond 1976). Bent (1953) listed extreme dates of 1 Oct. and 8 April. Bond (1950) called it a "rather rare winter resident at low elevations." Listed by Newton and Newton (1881), Salvin and Godman (1881), Cory (1886, 1892), Scott (1893), and Ridgway (1902).

Seiurus aurocapillus - Ovenbird.

40 specs.:

	day	year	mus.	nos.	ref
Oct.	6	1937	AMNH		
	10	1862	MCZ		
	19-29	1907	AMNH	4	
	"	"	ROM		
N=7					
Nov.	5-30	1907	AMNH	2	
	"	"	FM	2	

	"	"	MCZ	
	22-29	1890	MCZ	3
	?	1862	USNM	
N=9				
Dec.	1-26	1890	MCZ	3
N=3				
Jan.	6-26	1891	FM	2
			MCZ	2
N=4				
Feb.	3,5	1907	AMNH	
	"	"	MCZ	
	14	1904	BMNH	
	15	1906	MCZ	
	19	1893	AMNH	
	?	1865	MCZ	
			USNM	
N=7				
March	11	?	USNM	abc
	12	1906	BMNH	
	27	1894	AMNH	
	?	1863	AMNH	
	"	"	FM	
N=5				
April	?	1866	USNM	
N=1				

undated	?	1853	BMNH	
	?	?	BMNH	3

N=4

a - Sclater 1861

b - Albrecht 1862

c - Baird 1865

Additional specs. (not located): 2 inds. from 4 Nov. 1861 (Baird 1865). Lack and Lack (1972) wrote that this species is "common in Jamaica on the floor in all types of natural forest from the lowlands to the mountains." It feeds on dry ground normally where there is thick tree cover overhead (Lack 1976). Gosse (1847) listed extreme dates from mid-Sept. to 20 April. Diamond et al. (1977) netted 63 inds. (more than of any other warbler species) from Sept.-April; 9 of these were recaptured (maximum interval - 48 months) (Diamond and Smith 1973). Bond (1956) noted an ind. netted 29 Nov. 1955. Observed by March (1863), Ventura (1969), and Cruz (1972). Listed by Denny (1847), Sclater (1862), Newton and Newton (1881), Sharpe (1885), Cory (1892), Ridgway (1902), and Hellmayr (1935). 5 inds. reported in 1977 CBC.

Seiurus noveboracensis - Northern Waterthrush.

22 specs.:

	day	year	mus.	nos.	ref
Aug.	30	1861	BMNH		

N=1

Sept.	?	1865	USNM	
N=1				
Oct.	29	1907	AMNH	2
N=2				
Nov.	4-31	1907	AMNH	4
N=4				
Dec.	29	1902	BMNH	2
	?	1861	MCZ	
N=3				
Jan.	21	1891	FM	a
	25	1906	BMNH	
N=2				
Feb.	13	1906	MCZ	
	?	1864	AMNH	2
	?	1865	MCZ	
N=4				
March	5	1904	BMNH	b
	14	1866	USNM	
N=2				
undated	?	1853	BMNH	
	?	?	MCZ	
	?	?	USNM	

N=3

a - Scott 1893

b - Nicoll 1904

Additional specs. (not located): 28 Aug. 1858 and 4

Nov. 1861 (Baird 1865; Sclater 1861 and Albrecht 1862 noted

the first of these). Gosse (1847) first saw them at the end of Aug. and called them abundant thereafter. March (1863) considered them regular and listed an early sighting on 5 Aug. 1862 (the early date in Bent 1953). Lack and Lack (1972) termed them abundant in mangroves and "a regular, but sparse, inhabitant in lowland woods and cultivated woods on muddy ground, especially near standing water or muddy streams." This was reiterated by Lack (1976). Diamond et al. (1977) netted 10 inds., of which 1 was recaptured after 12 months (Diamond and Smith 1973). Listed by Sclater (1862), Newton and Newton (1881), Sharpe (1885), Cory (1892), and Hellmayr (1935). 1 ind. reported in 1977 CBC.

Seiurus motacilla - Louisiana Waterthrush.

13 specs.:

	day	year	mus.	nos.	ref
Sept.	5	1859	USNM		ab
	11,14	1905	BMNH	2	
N=3					
Oct.	12,26	1907	AMNH	2	
N=2					
Nov.	5	1907	AMNH		
	6	1904	AMNH		
N=2					
Dec.	1-30	1890	MCZ	3	c
N=3					

Jan.	20	1891	MCZ	c
	24	1891	FM	c

N=2

undated	?	?	BMNH
---------	---	---	------

N=1

a - Sclater 1861

b - Baird 1865

c - Scott 1893

Sclater (1861) noted 2 specs. from 5 Sept. 1859 (1 more than in the above list; also in Albrecht 1862; Bent 1953 listed this as an early fall date) and indicated that he had additional specs. in his collection. Scott (1893) noted 6 specs. (presumably including the 5 above) and called this a rather common winter resident. Lack and Lack (1972) wrote that it occurs "regularly in rather small numbers along rocky forest streams and, at times, along wider rocky rivers." It occurs along streams in the mountains and at mid-levels; in the lowlands, this species is found around rocks near running water, whereas the Northern Waterthrush uses muddy areas by still water (Lack 1976). Listed by Sclater (1862), Newton and Newton (1881), Salvin and Godman (1881), Sharpe (1885), Cory (1892), Ridgway (1902), Cooke (1904), and Hellmayr (1935).

[Oporornis formosus - Kentucky Warbler.]

1 spec. reported, no date (not located; Bond 1965).

Geothlypis trichas - Common Yellowthroat.

93 specs.:

	day	year	mus.	nos.	ref
Oct.	6	1904	AMNH		
N=1					
Nov.	8-22	1907	AMNH	4	
	28	1890	MCZ		d
N=5					
Dec.	1-31	1890	MCZ	14	d
	"	"	ANSP	2	
	3	1907	AMNH		
	?	1906	AMNH	2	
N=19					
Jan.	2,29	1908	AMNH	2	
	2-31	1891	MCZ	29	d
	"	"	FM	5	d
N=36					
Feb.	2-12	1891	MCZ	10	d
	"	"	FM	3	d
	5	1908	AMNH		
	10	1907	AMNH		
	13	1906	MCZ	2	
	?	1864	AMNH		
N=18					
March	5	1904	AMNH		
	26	1894	AMNH		

	?	1863	AMNH	2	c
N=4					
April	6,7	1978	USNM	2	
	10	1898	AMNH		
	22	1859	USNM		c
N=4					
May	10	1862	USNM		bc
N=1					
June	7	1978	USNM		
N=1					
undated	*	1862	USNM		bc
	?	1876	BMNH		
	?	1889	BMNH		
	?	?	BMNH	3	a

N=6

a - Sclater 1861, 1862

b - March 1863

c - Baird 1865

d - Scott 1893

Gosse (1847) considered this species quite common later in autumn, particularly in marshy places. Lack and Lack (1972) considered them common in the lush herb layer (usually between 1 and 1.5 m high) at the edges of swamps and some forests. Lack (1976) pointed out that this is the only warbler species that uses this type of habitat. March (1863) noted that stragglers were found even in summer; as usual, however, March's information must be considered

unreliable. Gosse (1847) listed 1 May as a late date (it was the latest of the warblers) and Bent (1953) listed 10 May; the June spec. above was collected more recently. Sightings have been reported from 13 Aug. (Bond 1969) and 7 Sept. (Bond 1952). Over several years, 48 inds. were netted (Diamond 1973, Diamond et al. 1977); at least 9 of these were recaptured (maximum interval - 33 months) (Diamond and Smith 1973). Listed by Newton and Newton (1881). The most common warbler in the 1977 CBC (17 inds.).

[Wilsonia citrina - Hooded Warbler.]

1 spec. reported (not located), undated (Baird 1865). Listed thereafter by Newton and Newton (1881), Sharpe (1885), Cory (1886, 1892), Scott (1893), Ridgway (1902), and Bond (1950). Bond (1965) reported that an ind. had been banded.

Wilsonia pusilla - Wilson's Warbler.

Sightings, 9-10 Dec. (Bond 1974) and 7 Sept. (Bond 1976). Listed by American Ornithologists' Union (1983).

[Wilsonia canadensis - Canada Warbler.]

Sightings, 23 Feb. and 28 Sept. (Bond 1982). The former date is particularly questionable.

DISCUSSION

There are two species of breeding warblers on Jamaica: Dendroica petechia and Dendroica pharetra. Thirty-two species of migrants have been reported. The 15 of these that winter regularly (and the number of specs. that I have located) are:

<u>Geothlypis trichas</u>	93
<u>Dendroica dominica</u>	82
<u>Parula americana</u>	72
<u>Dendroica discolor</u>	66
<u>Dendroica tigrina</u>	44
<u>Setophaga ruticilla</u>	43
<u>Seiurus aurocapillus</u>	40
<u>Mniotilta varia</u>	36
<u>Dendroica caerulescens</u>	34
<u>Seiurus noveboracensis</u>	22
<u>Dendroica palmarum</u>	20
<u>Dendroica coronata</u>	13
<u>Seiurus motacilla</u>	13
<u>Helmitheros vermivorus</u>	10
<u>Limnothlypis swainsonii</u>	5

The occurrences of Dendroica striata and Dendroica virens are documented by 1 spec. each. I have not located the specimens noted in the literature of Dendroica pensylvanica, Dendroica magnolia, Oporornis formosus, and

Wilsonia citrina (the latter two species are documented on the basis of undated specimens and may be considered questionable). Individuals of Vermivora pinus and Vermivora peregrina have been netted and banded. These 8 species should be considered rare or accidental. The remaining 9 species are included on the basis of sight reports.

Vermivora chrysoptera, Vermivora ruficapilla, Dendroica fusca, Dendroica castanea, Protonotaria citrea, and Wilsonia pusilla are listed on the basis of reasonably reliable information. Vermivora celata, Dendroica pinus, and Wilsonia canadensis must be considered hypothetical elements of the avifauna in the absence of more substantive verification.

LITERATURE CITED

- American Ornithologists' Union. 1983. Check-list of North American birds. 6th ed. American Ornithologists' Union, Washington, D. C. 877 p.
- Albrecht, R. 1862. Ornithologie von Jamaica. J. f. Ornithologie 10:192-207.
- Baird, S. F. 1865. Review of American birds in the Museum of the Smithsonian Institution. Part 1, North and Middle America. Smithsonian Misc. Coll. 181. 449 p.
- Baker, J. H. 1930. Notes on Jamaican birds. Auk 47:269-270.

- Bent, A. C. 1953. Life histories of North American wood warblers. Bull. U. S. Nat. Mus. 203:1-734.
- Bond, J. 1930. The resident West Indian warblers of the genus Dendroica. Proc. Acad. Nat. Sci. Phila. 82:329-337.
- _____. 1942. Additional notes on West Indian birds. Proc. Acad. Nat. Sci. Phila. 94:89-100.
- _____. 1944. Notes on the Arrow-headed Warbler. Wilson Bull. 56:172-173.
- _____. 1950. Check-list of birds of the West Indies. 3rd ed. Wickersham Printing Co., Lancaster, Pa. 200 p.
- _____. 1951. First supplement to the check-list of birds of the West Indies. Acad. Nat. Sci. Phila. 22 p.
- _____. 1952. Second supplement to the check-list of birds of the West Indies (1950). Acad. Nat. Sci. Phila. 24 p.
- _____. 1956. First supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 8 p.
- _____. 1957. Second supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 14 p.
- _____. 1964. Ninth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 13 p.
- _____. 1965. Tenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 16 p.
- _____. 1966. Eleventh supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 13 p.

- _____. 1967. Twelfth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 22 p.
- _____. 1968. Thirteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1969. Fourteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 10 p.
- _____. 1970. Fifteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 15 p.
- _____. 1971. Sixteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 15 p.
- _____. 1972. Seventeenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 11 p.
- _____. 1973. Eighteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1974. Nineteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1976. Twentieth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 14 p.

- _____. 1978. Twenty-second supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 20 p.
- _____. 1980. Twenty-third supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 14 p.
- _____. 1982. Twenty-fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 16 p.
- Cory, C. B. 1886. The birds of the West Indies, including the Bahama Islands, the Greater and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Part I. Auk 3:1-59.
- _____. 1892. Catalogue of West Indian birds, containing a list of all species known to occur in the Bahama Islands, the Greater Antilles, the Caymans, and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Publ. by the author, Boston. 163 p.
- Cruz, A. 1972. Birds of the Lluídas Vale (Worthy Park) region, Jamaica. Quart. J. Fla. Acad. Sci. 35:72-80.
- Danforth, S. T. 1928. Birds observed in Jamaica during the summer of 1926. Auk 45:480-491.
- Denny, W. 1847. A few remarks on the geographical distribution of birds in the West Indies. Proc. Zool. Soc. London 1847:36-41.
- Diamond, A. W. 1973. Altitudinal variation in a resident and a migrant passerine on Jamaica. Auk 90:610-618.

- _____, P. Lack, and R. W. Smith. 1977. Weights and fat condition of some migrant warblers in Jamaica. *Wilson Bull.* 89:456-465.
- _____ and R. W. Smith. 1973. Returns and survival of banded warblers wintering in Jamaica. *Bird-Banding* 44:221-224.
- Field, G. W. 1894. Notes on the birds of Port Henderson, Jamaica, West Indies. *Auk* 11:117-127.
- Gochfeld, M. 1974. Status of the genus Vermivora (Aves, Parulidae) in the Greater Antilles with new records from Jamaica and Puerto Rico. *Carib. J. Sci.* 14:177-181.
- _____. 1985. Numerical relationships between migrant and resident bird species in Jamaican woodlands. *Ornithol. Monogr.* 36:654-662.
- Gosse, P. H. 1847. The birds of Jamaica. John Van Voorst, London. 447 p.
- Hellmayr, C. E. 1935. Catalogue of birds of the Americas and adjacent islands. *Field Mus. Nat. Hist., Zool. Ser.* 13:Part 8:1-541.
- Lack, D. 1976. Island biology illustrated by the land birds of Jamaica. Univ. Calif. Press, Berkeley. 445 p.
- _____ and P. Lack. 1972. Wintering warblers in Jamaica. *Living Bird* 11:129-153.
- Loftin, H. 1977. Returns and recoveries of banded North American birds in Panama and the tropics. *Bird-Banding* 48:253-258.

- March, W. T. 1863. Notes on the birds of Jamaica. Proc. Acad. Nat. Sci. Phila. 16:150-154, 283-304.
- Meanley, B. 1971. Natural history of the Swainson's Warbler. North Amer. Fauna 69. Bureau of Sport Fish. and Wildl., U. S. Dept. Interior, Washington, D. C. 90 p.
- Merriam, C. H. 1885. Swainson's Warbler in Jamaica. Auk 2:377.
- Moreno, A. 1940. Notas sobre ornitologia cubana. III. Nuevo record. Mem. Soc. Cubana Hist. Nat. 14:409.
- Newton, A. 1879. Exhibition of, and remarks upon, some bird-skins obtained by Mr. E. Newton, C.M.Z.S., in Jamaica. Proc. Zool. Soc. London 1879:552-553.
- _____ and E. Newton. 1881. List of the birds of Jamaica. Extracted from the Handbook of Jamaica for 1881. Government Printing and Stationery Establishment, Kingston, Jamaica. P. 103-117.
- Nicoll, M. J. 1904. On a collection of birds made during the cruise of the 'Valhalla', R.Y.S., in the West Indies (1903-4). Ibis 1904:555-591.
- Norton, R. L. 1983. The autumn migration: West Indies region. Amer. Birds 37:228-229.
- Peters, J. L. 1927. A revision of the Golden Warblers, Dendroica petechia (Linne). Proc. Biol. Soc. Wash. 40:31-41.
- Ridgway, R. 1902. The birds of North and Middle America. Part II. Bull. U. S. Nat. Mus. 50:1-834.

- Salvin, O. and F. D. Godman. 1881. *Biologia Centrali-Americana. Aves. Vol. I.* Taylor and Francis, London. 512 p.
- Sclater, P. L. 1861. List of a collection of birds made by the late Mr. W. Osburn in Jamaica, with notes. *Proc. Zool. Soc. London* 1861:69-82.
- _____. 1862. *Catalogue of a collection of American birds.* N. Trubner and Co., London. 368 p.
- Scott, W. E. D. 1893. Observations on the birds of Jamaica, West Indies. II. A list of the birds recorded from the island, with annotations. *Auk* 10:339-342 (part).
- Sharpe, R. B. 1885. *Catalogue of birds in the British Museum. Vol. 10.* The British Museum, London. 682 p.
- Sloane, H. 1725. *A voyage to the islands Madera, Barbados, Nieves, S. Christophers and Jamaica with the natural history of the herbs and trees, four-footed beasts, fishes, birds, insects, reptiles & c.* Vol. II. Printed by the author, London. 499 p.
- Tordoff, H. B. 1952. Notes on birds of Jamaica. *Auk* 69:320-322.
- Ventura, A. K. 1969. Birds of Caymanas Estates - Jamaica, their collection and habits. *Carib. J. Sci.* 9:39-51.

WARBLERS OF THE WEST INDIES

VIII. HISPANIOLA

This is the eighth in a series of papers concerning the distribution and natural history of wood-warblers (Emberizidae:Parulinae) in the West Indies. Hispaniola consists of the independent nations of Haiti on the west and the Dominican Republic on the east. Within each species account, Haiti is treated first and is followed by fringing islands listed in a counterclockwise direction in the following order: Tortue near the northern Dominican border, Gonave and Petite Gonave, Gran and Petite Cayemite, Navassa (a United States possession off Haiti's southwest coast), and Ile a Vache. The Dominican Republic follows and then its fringing islands resuming from the south in a counterclockwise sequence: Islas Beata, Catalina, and Saona, Cayo de Levantado, and the Siete Hermanos at the northern Haitian-Dominican border.

Data sources were the specimens housed in museum collections, and published literature. Wetmore and Swales (1931, hereafter W&S for brevity) covered essentially the same material. I have attempted to avoid repeating information and have concentrated on details they omitted and information that has become available since their publication.

The status of extant specimens is indicated in tables in the text. Each row refers to one specimen unless

otherwise indicated in the numbers column. Ditto marks under dates indicate that a single series of specimens is housed in more than one collection. The common literature references to the existence of specimens are symbolized by the following letters:

- a - Tristram 1884
- b - Cory 1885
- c - Cherrie 1896
- d - Peters 1917
- e - Bond 1928
- f - Wetmore and Swales 1931
- g - Wetmore 1932
- h - Wetmore and Lincoln 1933

Less frequently used references will be marked with an asterisk and referred to below the tables. Museum names will be abbreviated throughout:

- AMNH - American Museum of Natural History
- ANSP - Academy of Natural Science of Philadelphia
- BMNH - British Museum (Natural History)
- CM - Carnegie Museum of Natural History
- FM - Field Museum of Natural History
- LSU - Louisiana State University Museum of Zoology
- MCZ - Museum of Comparative Zoology, Harvard
- MNHN - Museo Nacional de Historia Natural, Santo Domingo
- PM - Peabody Museum, Yale
- ROM - Royal Ontario Museum
- UF - Florida State Museum

UMMZ - University of Michigan Museum of Zoology

USNM - United States National Museum

The results of 11 Santo Domingo (Dominican Republic) Christmas Bird Counts (CBC's) held from 1974 to 1986 are included in the text.

SPECIES ACCOUNTS

Vermivora pinus - Blue-winged Warbler.

Haiti - Sighting, 17 Sept. 1983 (Bond 1984).

Dominican Republic - 1 spec., from April 1979 (MNHN). Sightings, 3 Jan. 1974 and then of 2 inds. in another spot on 5 and 17 Jan. 1974 (Abramson et al. 1974; also in Bond 1974). Listed as rare by Dod (1981).

Vermivora chrysoptera - Golden-winged Warbler.

Dominican Republic - Spec. reported (not located), 24 Jan. 1970 (Bond 1971, Gochfeld 1974). Sighting, 4 Feb. 1982 (Norton 1982, Bond 1984).

Vermivora peregrina - Tennessee Warbler.

Dominican Republic - Sighting, 13 Oct. 1974 (Bond 1976). Listed by Dod (1981).

Vermivora ruficapilla - Nashville Warbler.

Haiti - Sighting, 17 Sept. 1983 (Bond 1984).

Parula americana - Northern Parula.

This species is "common at times, particularly in the Dominican Republic" (W&S). Listed for Hispaniola by Cory (1885, 1892) and Terborgh and Faaborg (1980, in secondary sclerophyll scrub).

Haiti - 9 specs.:

	day	year	mus.	nos.	ref
Nov.	24	1917	USNM		f
N=1					
Dec.	1	1928	FM		
N=1					
Jan.	12-28	1881	FM	4	f
	14	1929	USNM		
N=5					
Feb.	27	1929	USNM		f
N=1					
March	6	1929	USNM		
N=1					

Additional specs. (not located): 4 and 5 April 1927 (W&S). Sightings: 3 April 1917 (W&S), 4 April 1931 (Wetmore and Lincoln 1933; a late date in Bent 1953). 1 banded (Woods 1975). Cory (1881) and Bond (1928) considered it a common migrant. Listed by Hellmayr (1935).

Gonave - 6 specs.: 5 from 7-12 March 1929 (USNM; W&S) and 1 from 27 March 1959 (PM). Observed by Bond (1928).

Navassa - 1 spec., 21 Oct. 1965 (UF).

Dominican Republic - 68 specs.:

	day	year	mus.	nos.	ref
Oct.	10,30	1963	LSU	3	
	12-23	1916	AMNH	2	f
	"	"	USNM		f
	24	1922	AMNH		
	25	1978	MNHN		
N=8					
Nov.	15	1916	AMNH		
	25	1921	AMNH		
	25	1922	AMNH		
N=3					
Dec.	8,14	1882	FM	2	
	21-30	1906	AMNH	4	f
	"	"	ROM	2	f
N=8					
Jan.	1-31	1907	ROM	14	f
	17	1922	AMNH		
	20	1884	BMNH		a
	22-29	1895	FM	5	c
N=21					
Feb.	1-18	1907	ROM	8	f
	2-24	1895	FM	4	c
N=12					
March	1,5	1907	ROM	2	f
	4-29	1895	FM	8	c
N=10					

April	2	1895	FM	c
	6,14	1883	FM	3

N=4

undated	?	1884	BMNH	a
	?	1886	AMNH	

N=2

Additional specs. (not located): 21 and 23 Oct. 1928 (W&S). Verrill and Verrill (1909) considered it very common during migration. Peters (1917) shot the only ind. he saw in his trip on 10 Feb. 1916 but did not preserve it as a specimen. Dod (1981) considered it very common in all types of forests. Listed by Sharpe (1885) and Hellmayr (1935). 1-6 inds. reported in 9/11 CBC's.

Isla Saona - Sightings: in Dec. (2 inds., Schwartz 1969) and 5-7 April 1974 (Faaborg 1980).

Dendroica petechia albicollis - Yellow Warbler.

Early drawings of a Yellow Warbler from Hispaniola were given the name Motacilla albicollis (Peters 1917 summarized the early history and noted that "doubtless the types ... have long since disappeared"). Cassin (1860) noted the distinctiveness of Dendroica albicollis of Hispaniola (and Cuba) from other Yellow Warblers. Ridgway (1902) tentatively grouped Haitian birds with those from Jamaica. Bartsch (1917) showed Haitian specimens to be distinct from birds from Jamaica and used the name D. petechia albicollis. This name has been used thereafter for Hispaniolan birds

(but see discussion below under Gonave). Bond (1930) wrote that although these birds inhabit mangroves, they "frequently leave the seclusion of the mangroves during or after the breeding season but never wander far from their favorite haunts."

Haiti - 28 specs.:

	day	year	mus.	nos.	ref
July	7,19	1962	LSU	6	
	18	1927	ANSP		

N=7

Feb.	3	1866	USNM	2	**
	8-19	1929	USNM	3	f
	14	1928	ANSP	3	e

N=8

April	3-15	1947	CM	9	
	27	1927	USNM		f

N=10

June	21,26	1917	USNM	3	f
------	-------	------	------	---	---

N=3

** - Bartsch 1917

Additional specs. (not located): 2 from 3 March 1866 (W&S), 5 from 1-29 April 1917 (Bartsch 1917, W&S), and 4 from Bug Island, 18 April 1930 (Wetmore 1932).

Tortue - Bond (1928) considered this species common.

Gonave - 33 specs.:

	day	year	mus.	nos.	ref
July	7	1920	USNM		f+
	15-20	1927	USNM	6	*
	"	"	AMNH	2	*

N=9

Feb.	25	1928	USNM	2	f
------	----	------	------	---	---

N=2

March	16-21	1920	USNM	11	f+
	"	"	CM	2	f+
	"	"	MCZ	2	f+

N=15

April	4,9	1959	PM	5	
	"	"	UF	2	

N=7

* - Danforth 1929

+ - Wetmore 1929

Gonave - Bond (1928) noted that Yellow Warblers were common on Gonave, but did not differentiate them from birds on the main island. Wetmore (1929) considered them distinctive enough to warrant description as D. petechia solaris, a new subspecies. Danforth (1929) found 100% animal matter, primarily lepidopteran larvae and beetles, in the 5 stomachs examined; he considered the birds common. Bond (1930) considered them "common in mangrove swamps along the coast." Hellmayr (1935) recognized this new subspecies from Gonave and Petite Gonave. Bond (1940) included solaris

under albicollis without explanation, as did Lowery and Monroe (1968) and other recent authors.

Petite Gonave - 4 specs., 19 March 1930 (USNM; Wetmore 1932 collected these and indicated that they were D. p. solaris).

Gran Cayemite - 1 spec., 13 April 1930 (USNM; Wetmore 1932).

Petite Cayemite - 2 specs., 16 April 1930 (USNM; Wetmore 1932).

Ile a Vache - Observed, 29 April 1931 (Wetmore and Lincoln 1933).

Dominican Republic - 38 specs.:

	day	year	mus.	nos.	ref
Aug.	4	1963	LSU		
N=1					
Sept.	11-19	1963	LSU	8	
	"	"	UMMZ	2	
N=10					
Oct.	9	1916	AMNH		
N=1					
Nov.	1	1971	LSU	8	
N=8					
Feb.	16, 17	1916	MCZ	3	df
	24	1974	MNHN		
N=4					
March	10	1974	MNHN		
N=1					

May 11 1927 USNM f

N=1

June 23,24 1927 AMNH 2

 23-25 1969 LSU 10

N=12

First noted, from the north coast, by Peters (1917, 1927) and then by Danforth (1929). Observed on the south coast by Wetmore and Lincoln (1933). Schwartz and Klinikowski (1965) commented on the Dominican distribution of this species and noted that it was the most common bird in acacia scrub, often several kilometers from the mangrove border, in Oct. 1963. Dod (1981) listed it as common in mangroves and noted that it lays 2-3 eggs in nests built in low shrubs in marshy places.

Siete Hermanos - 16 specs. (all in W&S): 1 from Monte Chico, 29 Jan. 1929 (USNM); 1 from Muertos, 29 Jan. 1929 (USNM); 4 from Ratas, 4 Feb. 1929 (2 in USNM, 1 each in CM and MCZ); 2 from Tororu, 29 Jan. 1929 (USNM); 8 from Tercero, 31 Jan. 1929 (USNM). Schwartz and Klinikowski (1965) claimed to have material from the Siete Hermanos (not located).

Dendroica pensylvanica - Chestnut-sided Warbler.

Haiti - Sightings, 21 and 22 April 1917 (Bartsch 1917, also in W&S, Moreno 1940, Bond 1950).

Dendroica magnolia - Magnolia Warbler.

Haiti - 1 spec., 28 March 1929 (USNM; W&S).

Dominican Republic - 4 specs.: 2 from 14 Oct. 1974 (MNHN) and one each from 14 Dec. 1882 (FM; Cory 1885, 1892, Ridgway 1902, Cooke 1904, W&S, Hellmayr 1935) and 12 Feb. 1907 (AMNH; Verrill and Verrill 1909, W&S). Listed as uncommon in forests by Dod (1981). CBC: 3/11 counts (total - 7 inds.).

Dendroica tigrina - Cape May Warbler.

This species is "particularly numerous in Hispaniola" (Bond 1950). Observed in open pine forest, sclerophyll scrub, and secondary deciduous forest by Terborgh and Faaborg (1980). W&S summarized the early references to this species on Hispaniola and observed the bird in low cover in the highlands as well as in the logwoods and mesquite of the hot lowlands. Wetmore and Lincoln (1933) learned of an older spec. taken on 1 Nov. in or before 1758 off the coast of the island. Listed by Cory (1885, 1892).

Haiti - 49 specs.:

	day	year	mus.	nos.	ref
Nov.	19,24	1917	USNM	2	f
N=2					
Dec.	1	1917	USNM		f
	1	1928	FM		
	29	1928	USNM		f

N=3

Jan.	8-19	1929	USNM	5	f
	13-28	1881	FM	9	

N=14

Feb.	6,7	1929	USNM	6	f
	13	1982	USNM		
	16-19	1881	FM	8	
	21	1866	USNM		f

N=16

March	1-7	1881	FM	3	
	26	1929	USNM		f
	27,28	1931	USNM	2	h

N=6

April	7,14	1927	USNM	2	
	10	1931	USNM	2	h
	13,15	1917	USNM	2	f

N=6

unknown			BMNH		
			MCZ		

N=2

Additional specs. (not located): 19 April 1866 (W&S), 4 more in the April 1912 series, as late as 24 April (W&S), 21 Dec. 1927 (Bond 1928), and 3 from Bug Island, 18 April 1930 (Wetmore 1932). Cory (1881) considered them very abundant in Feb. and March. Inds. banded (Woods 1975). Listed by Hellmayr (1935).

Tortue - Spec. reported (not located), 2 Feb. 1917 (W&S).

Gonave - 10 specs.: 7 from 6-11 March 1929 (USNM; W&S) and 3 from 23-27 March 1959 (PM). Additional specs. (not located): 22 Feb. 1918 and 6 March 1920 (W&S). Observed by Bond (1928).

Petite Cayemite - 3 specs., 13-16 April 1930 (USNM; Wetmore 1932).

Ile a Vache - 3 specs., 28-29 April 1931 (USNM; Wetmore and Lincoln 1933; a late date in Bent 1953).

Dominican Republic - 108 specs.:

	day	year	mus.	nos.	ref
Oct.	1-9	1963	LSU	4	
	9	1922	AMNH		
	12	1972	MNHN	3	
	14,20	1916	AMNH	2	f
	23	1916	USNM		
	27	1975	MNHN		
	?	1988	MNHN		

N=13

Nov.	14	1906	AMNH		
------	----	------	------	--	--

N=1

Dec.	5	1882	BMNH		
	6-12	1916	AMNH	3	
	7,19	1978	MNHN	2	
	18	1980	MNHN		
	22-27	1906	AMNH	4	
	"	"	ROM		

N=12

Jan.	2	1921	AMNH		
	3-12	1922	AMNH	4	
	12	1883	FM		
	13	1967	LSU		
	16-25	1895	FM	3	c
	17-28	1907	ROM	6	
	"	"	AMNH		
	22	1917	AMNH		
	31	1976	MNHN		
N=19					
Feb.	2-26	1907	ROM	19	
	"	"	AMNH	5	
	2-28	1895	FM	14	c
	6-28	1916	MCZ	4	d
	8	1983	MNHN		
	24	1986	MNHN		
N=44					
March	1	1979	MNHN		
	1-18	1907	ROM	5	
	2-12	1922	AMNH	3	
	"	"	USNM		
	5-26	1895	FM	3	c
	9	1916	MCZ		d
N=14					
April	5	1986	MNHN		
	6	1895	FM		c

9 1985 MNHN

N=3

undated ? ? MNHN

N=1

Additional specs. (not located): 7 Oct., 5 Nov. and 28 Dec. 1928 and 1 Oct. 1929 (W&S). Verrill and Verrill (1909) wrote that they had nestling plumage birds "as well as females containing eggs ready for the nest" in their collection and that this was evidence for a local breeding population. Bond (1930) noted that this (and a similar claim for Jamaica) had never received confirmation and could be ignored. W&S felt that claims of breeding were "certainly erroneous." Sighting, 26 Aug. 1984 (Norton 1985; this is one of only a few West Indian reports from this month). Dod (1981) considered it abundant in forested areas. Listed by Bryant (1866) and Hellmayr (1935). CBC: This is the most common warbler reported (mean = 20.5 inds./count, ranging from 2-61).

Isla Saona - 5 inds. netted, 5-7 April 1974 (Faaborg 1980).

Dendroica caerulescens - Black-throated Blue Warbler.

This species inhabits woodlands from sea level to the tops of the highest mountains (W&S). Terborgh and Faaborg (1980) observed them in logged pine and in montane and limestone sclerophyll forests. Penard (1926) observed a male on board a ship north of Hispaniola on 27 Oct. 1921.

Listed for the island by Bryant (1866) and Cory (in 1885 as abundant in Feb. and March and again in 1892).

Haiti - 16 specs.:

	day	year	mus.	nos.	ref
Nov.	22,29	1917	USNM	2	f
N=2					
Jan.	11,19	1929	USNM	2	f
N=2					
Feb.	16-25	1881	FM	3	*
	27	1959	PM		
N=4					
March	24,26	1929	USNM	2	f
N=2					
April	5,10	1927	USNM	2	f
	14-19	1931	USNM	3	
N=5					
undated			MCZ		
N=1					

* - Cory 1881

Additional specs. (not located): 2 on 3 March and 1 on 13 April 1866, and 1 on 1 April 1917 (W&S). Wetmore and Lincoln (1933) noted them regularly from 30 March-6 May 1931 (the latter is a late date in Bent 1953); in one region, most birds seen were females. Woods (1975) banded 12 females and 1 male and noted 1 return. (There are more males than females among the Haitian specs. located). Bond (1928) considered them common, particularly in the

mountains. Listed by Cory (1881, as abundant in Feb. and March), Sharpe (1885), Ridgway (1902), Cooke (1904), and Hellmayr (1935).

Tortue - Observed until mid-May 1917 (W&S).

Gonave - 4 specs., 4-9 March 1929 (USNM; W&S).

Gran Cayemite - 1 spec., 13 April 1930 (USNM; Wetmore 1932).

Dominican Republic - 113 specs.:

	day	year	mus.	nos.	ref
Oct.	5	1916	USNM	2	f
	9	1971	LSU	2	
	12	1972	MNHN		
	14	1974	MNHN		
	23-29	1963	LSU	3	
	30,31	1916	AMNH	3	f

N=12

Nov.	3	1976	MNHN		
	3-14	1916	AMNH	4	f

N=5

Dec.	4	1916	AMNH		f
	7	1972	MNHN		
	24	1906	AMNH	4	f
	"	"	ROM		f

N=7

Jan.	9-24	1907	ROM	19	f
	17-22	1980	USNM	4	
	21-28	1895	FM	14	c

	22	1917	AMNH		
	29	1975	MNHN		
	31	1922	USNM		f
N=40					
Feb.	1	1924	AMNH		
	1-27	1895	FM	19	c
	5	1922	AMNH		
	27	1907	ROM	2	f
	27	1917	AMNH		
N=24					
March	1-27	1895	FM	15	c
	5	1922	AMNH		
	6	1917	AMNH		f
	7	1907	ROM		f
	11-25	1916	MCZ	3	d
	26	1922	AMNH		
N=22					
April	4	1895	FM		c
N=1					
May	16	1917	AMNH		
N=1					
unknown			BMNH		
N=1					

Additional specs. (not located): 1 or more received by Tristram (1884), 1 on 5 March and 4 from 9-25 Oct. 1928 (W&S). The 5 Oct. 1916 spec. listed above has been identified as D. c. cairnsi (W&S, Hellmayr 1935; all others

are presumably D. c. caerulescens); this is also an early date in Bent (1953). Cherrie (1896) collected 49 specs. and wrote that this is "decidedly the most common of the North American birds." Peters (1917) felt that, although this is a common migrant, it is not common during winter (he was working in the northern lowlands where the bird may be less common). Observed in Feb. at about 9000 ft (Bond 1977) and in April (Norton 1980). Sclater (1857) noted it from pines in the interior mountains; Verrill and Verrill (1909) considered it an abundant migrant; listed by Hellmayr (1935). Dod (1981) considered it abundant at all elevations wherever there were trees. CBC: 9/11 counts; highly variable in numbers - most years in the 0-8 range, but 20 in 1976 and 30 in 1975.

Dendroica coronata - Yellow-rumped Warbler.

W&S considered this species more common in eastern than in western Hispaniola. Terborgh and Faaborg (1980) observed it in logged and open pine forests. Listed by Sharpe (1885) and Cory (1885, 1892, as common).

Haiti - 22 specs.:

	day	year	mus.	nos.	ref
Jan.	13-25	1881	FM	12	
N=12					
Feb.	11	1881	FM		
	13-27	1929	USNM	5	f
N=6					

March	26	1929	USNM	2	f
-------	----	------	------	---	---

N=2

April	21	1917	USNM		f
-------	----	------	------	--	---

N=1

unknown			BMNH		
---------	--	--	------	--	--

N=1

Sightings, as late as 27 April 1917 (W&S; a late date in Bent 1953). Bond (1928) considered it common in more open country. Listed by Cory (1881, as common) and Hellmayr (1935).

Tortue -1 spec. reported (not located), 4 Feb. 1917 (W&S).

Gran Cayemite - 1 spec., 14 Jan. 1918 (USNM; W&S).

Dominican Republic - 67 specs.:

	day	year	mus.	nos.	ref
Nov.	16,20	1923	BMNH	2	
N=2					
Dec.	13,14	1904	BMNH	2	
	19	1921	AMNH		
	22-25	1906	AMNH	4	
N=7					
Jan.	2,17	1922	AMNH	2	
	3-30	1907	ROM	13	f
	20,24	1917	AMNH	2	f
N=17					
Feb.	4-20	1907	ROM	23	f
	18	1916	MCZ		d

	22-26	1895	FM	3	c
	27	1917	AMNH		f
N=28					
March	2-27	1922	AMNH	3	
	6	1917	AMNH		
	16-27	1895	FM	6	c
	18	1907	ROM		f
N=11					
April	10	1916	MCZ		d
N=1					
undated	?	1884	BMNH		
N=1					

Additional specs. (not located): 3 inds. on 1 Oct. 1929 (W&S; an early date in Bent 1953) and 2 from 19 and 27 Feb. 1895 (Christy 1897). Bond (1977) reported a late Feb. sighting at about 9000 ft. In 1895, Cherrie (1896) saw none later than 27 March. Peters (1917) considered them abundant, particularly in cactus and acacia woods; he noted that they left early, many by 15 March and essentially all by 1 April. Verrill and Verrill (1909) considered them very common during migration. Dod (1981) considered them uncommon but widespread. Listed by Sclater (1857), Bryant (1866), and Hellmayr (1935). CBC: 3/11 counts (total - 10 inds.).

Siete Hermanos - 2 specs., Tercero, 21 and 31 Jan. 1929 (USNM; W&S).

Isla Saona - 1 spec. collected (not located) and small bands regularly encountered; the most abundant warbler, 28-31 Dec. 1968 (Schwartz 1969).

Dendroica virens - Black-throated Green Warbler.

Ile a Vache - 1 spec., 30 April 1930 (USNM; Wetmore 1932, Bent 1953).

Dominican Republic - 1 spec., 14 Oct. 1974 (MNHN). 1 ind. reported in 1979 CBC. Dod (1981) indicated that they occurred uncommonly in high elevation pine forests.

Isla Beata - 1 spec., 22 Oct. 1978 (MNHN; Bond 1982).

Dendroica fusca - Blackburnian Warbler.

Dominican Republic - 1 spec., 18 Oct. 1916 (AMNH). Sightings: 14 April (Bond 1982) and 5 March (Norton 1983).

Siete Hermanos - 1 spec. reported, 6 Oct. 1963, Isla Muertos (not located; Schwartz and Klinikowski 1965).

Dendroica dominica - Yellow-throated Warbler.

Terborgh and Faaborg (1980) observed this species in logged, open, and secondary pine forests. Cory (1885) termed it a common winter visitant. Listed for Hispaniola by Salvin and Godman (1881) and Cory (1892). Early references to this species were summarized by W&S.

Haiti - 12 specs.:

	day	year	mus.	nos.	ref
Aug.	3	1962	LSU		
	11,12	1960	LSU	8	
	31	1971	USNM		

N=10

Feb.	28	1959	PM		
------	----	------	----	--	--

N=1

unknown			BMNH		
---------	--	--	------	--	--

N=1

Sightings: 27 April 1917 (W&S) and at several locales from 23 March-4 April 1931 (Wetmore and Lincoln 1933). Observed by Bond (1928) in several areas. On the basis of numbers of specimens, it appears that this species is considerably less common in Haiti than in the Dominican Republic. This may be related to the distribution of pine woods; in other parts of its winter range this species also frequents coastal palms.

Gonave - 1 spec., 29 March 1929 (USNM; W&S). Bond (1928) mentioned observations on Gonave, but, as W&S pointed out, he later corrected himself and noted that he was referring to the area around the city of Gonaives on the main island.

Ile a Vache - Sighting, 29 April 1931 (Wetmore and Lincoln 1933; a late date in Bent 1953).

Dominican Republic - 56 specs.:

	day	year	mus.	nos.	ref
Aug.	13	1963	LSU		
	14	1883	FM		
	16	1923	AMNH		
N=3					
Sept.	6	1976	MNHN		
	16	1883	BMNH		
	22-26	1916	USNM	4	f
	"	"	CM		f
	24	1963	LSU		
N=8					
Oct.	9	1916	USNM		f
	10	1971	LSU		
	23	1963	LSU		
N=3					
Nov.	12, 16	1882	FM	2	
	26	1922	AMNH		
	28	1916	AMNH	2	f
N=5					
Dec.	13	1966	LSU		
	14	1904	BMNH		
	24-26	1906	AMNH	4	
N=6					
Jan.	4-30	1907	ROM	4	f
	"	"	AMNH	2	f

	15	1922	AMNH		
N=7					
Feb.	1-28	1907	ROM	20	f
	12	1916	MCZ	2	d
	23	1921	USNM		f

N=23

March	13	1907	ROM		f
-------	----	------	-----	--	---

N=1

Additional specs. (not located): 1 in 1887 and others on 23 Oct. 1928 and 26 Aug. 1929 (W&S). Dod (1981) listed them as abundant in pines. Listed by Sclater (1857), Bryant (1866), Verrill and Verrill (1909), and Hellmayr (1935).
CBC: Reported in 5/11 counts (total - 9 inds.).

Dendroica pinus chrysoleuca - Pine Warbler.

This is one of the three warbler species that breeds in the pines of the Hispaniolan highlands. Cory (1885) noted that the specimens collected in July 1883 may have been residents. Verrill and Verrill (1909) wrote that the species is common and breeds in pine forests of the interior. Ridgway (1902) was not able to correctly place Hispaniolan birds due to a lack of pertinent specimens; he doubted, however, that they were the same as North American birds. Todd and Worthington (1911) examined Cory's specimens and felt that they were not greatly different from Bahaman birds. Griscom (1923) examined freshly collected Hispaniolan as well as Bahama and eastern United States

specimens and concluded that there were sufficient differences to describe this subspecies. Bond (1930) wrote that it "apparently occurs everywhere there are pine forests." In notes on nidification, Bond (1943) wrote that it "has not as yet been found nesting on the island," but that a female collected on 15 May contained newly formed eggs. Listed for the island by Cory (1892) and Bond (1950).

Haiti - 16 specs.

	day	year	mus.	nos.	ref
Aug.	11,12	1962	LSU	3	
N=3					
Feb.	21-27	1959	PM	2	
	"	"	BMNH		
N=3					
March	9	1959	PM		
N=1					
April	10-13	1927	USNM	4	f
N=4					
May	3	1928	ANSP	2	f
N=2					
June	7	1928	ANSP		f
	8	1930	ANSP		
N=2					
undated	?	1930	ANSP		
N=1					

The first evidence that this bird occurred in Haiti as well as in the Dominican Republic was the series of specs.

collected by Wetmore in 1927 in the La Selle region (W&S). Bond (1928) considered them common in that same region and later (Bond 1984) confirmed the limits of Haitian distribution.

Dominican Republic - 54 specs.

	day	year	mus.	nos.	ref
July	5-13	1963	LSU	2	
	"	"	UMMZ	2	
	10-19	1883	FM	6	bf
	"	"	BMNH		bf
	18	1922	AMNH		

N=12

Aug.	2	1923	AMNH		
	21	1978	USNM		
	21	1981	USNM	6	
	29	1972	PM	2	

N=10

Sept.	2	1972	MNHN	5	
	6	1974	MNHN		
	24	1916	USNM		f

N=7

Oct.	10	1971	LSU		
------	----	------	-----	--	--

N=1

Nov.	23	1966	LSU		
------	----	------	-----	--	--

N=1

Dec.	14	1966	LSU		
	31	1976	LSU		
N=2					
Feb.	27	1917	AMNH		
N=1					
March	6	1917	AMNH		
	15	1907	AMNH		
	17	1974	MNHN		
N=3					
April	11,29	1919	USNM	2	f
	15	1976	MNHN		
N=3					
May	1	1922	AMNH		
	13,15	1919	USNM	3	f
	20-26	1927	USNM	6	f
	"	"	CM	2	f
	"	"	MCZ		f
N=13					
June	18	1922	AMNH		
N=1					

Additional specs. (not located): 26 April 1929 (W&S) and 3 from Jan. 1917 (including the type; Griscom 1923, W&S; AMNH?). Danforth (1929) shot but did not recover a bird in late June 1926. Listed by Hellmayr (1935) and Dod (1981).

[Dendroica kirtlandii - Kirtland's Warbler.]

Dominican Republic - 1 undocumented sight report, early 1985 (Bond 1986, from the Ornithological Newsletter No. 46, June 1985).

Dendroica discolor - Prairie Warbler.

This species is found in thickets and low trees of the coastal plains and lower hills; it does not appear to go into the high mountainous interior (W&S, also in Nolan 1978). Terborgh and Faaborg (1980) observed it in pine, sclerophyll, and secondary deciduous forests as well as in lowland scrub regions. Listed for Hispaniola by Cory (1885, 1892) and Hellmayr (1935).

Haiti - 34 specs.:

	day	year	mus.	nos.	ref
Dec.	26,28	1928	USNM	2	f
N=2					
Jan.	8	1932	FM		
	15	1929	USNM		f
	26	1881	FM		
N=3					
Feb.	1	1881	FM		
	6-27	1929	USNM	10	f
	26	1959	PM		
N=12					
March	4	1866	USNM		f*
	6,9	1959	PM	2	

7	1881	FM		
24-27	1929	USNM	5	f
25,31	1930	USNM	2	g
26-31	1931	USNM	5	h

N=16

unknown

BMNH

N=1

* - Bryant 1866

Additional specs. (not located): 3 and 9 April 1917 and 16 March 1920 (W&S). Observed as late as 22 April 1927 (W&S, also in Nolan 1978). Wetmore and Lincoln (1933) considered it common in late March. 1 ind. banded by Woods (1975). Listed by Cory (1881), Ridgway (1902), and Cooke (1904).

Tortue - One spec. reported (not located), 31 Jan. 1917 (W&S). Bond (1928) considered it common.

Gonave - 10 specs.: 9 from 4-16 March 1929 (USNM; W&S) and 1 from 21 March 1930 (USNM; Wetmore 1932). Additional specs. (not located): 4 and 16 March 1920 (W&S). Bond (1928) considered it common.

Petite Gonave- 1 spec., 19 March 1930 (USNM; Wetmore 1932).

Gran Cayemite - 1 spec., 13 April 1930 (USNM; Wetmore 1932; a late date in Bent 1953).

Navassa - 1 spec., 21 Oct. 1965 (UF).

Dominican Republic - 53 specs.:

	day	year	mus.	nos.	ref
Sept.	11	1963	LSU		
	27-29	1916	AMNH	3	f
N=4					
Oct.	2-24	1916	AMNH	7	f
	10	1976	MNHN		
	17,24	1922	AMNH	2	
N=10					
Dec.	12,14	1904	BMNH	2	
	20-25	1906	AMNH	3	
	30	1968	LSU		
N=6					
Jan.	1	1902	ROM		
	17-31	1907	ROM	3	f
	21	1884	BMNH		
	21	1924	USNM		
N=6					
Feb.	1-10	1907	ROM	3	f
	5,27	1916	MCZ	2	d
	8	1922	USNM		f
	13	1895	FM	2	c
	24	1974	MNHN		
N=9					
March	1-30	1895	FM	13	c
	4-31	1916	MCZ	3	d

17 1907 ROM f

N=17

April 2 1895 FM c

N=1

Additional specs. (not located): Dec. 1925, 4 from 7-28 Oct. and 1 on 28 Dec. 1928 (W&S). Sightings: 22 Oct. 1978 (Bond 1982) and 26 Aug. 1984 (Norton 1985). Peters (1917) considered it a rather uncommon winter resident and a fairly common migrant in March. Cherrie (1896) did not consider it common at any time; Verrill and Verrill (1909) listed it as a common migrant. Dod (1981) considered it common in thickets and small trees. CBC: 6/11 counts (total - 7 inds.; none since 1980).

Isla Beata - 1 spec., 22 Oct. 1978 (MNHN).

Isla Saona - Seen regularly in both scrub and wooded sections, late Dec. 1968 (Schwartz 1969).

Siete Hermanos - One spec. reported (not located), 31 Jan. 1929 (W&S).

Dendroica palmarum - Palm Warbler.

This species has been noted from a variety of pine forests and a limestone sclerophyll forest (Terborgh and Faaborg 1980). W&S reviewed earlier records. All reports are presumably of the nominate subspecies. Listed by Bryant (1866) and Cory (1885, 1892).

Haiti - 15 specs.:

	day	year	mus.	nos.	ref
Nov.	18	1917	USNM		
N=1					
Dec.	21	1927	ANSP		
	28	1928	USNM		f
N=2					
Jan.	3	1929	USNM	2	f
	26	1866	USNM		f
N=3					
March	5	1917	USNM		f
	11,26	1929	USNM	2	f
	31	1927	USNM		
	31	1930	USNM		g
N=5					
April	1	1927	USNM		
	1	1936	USNM		
	14	1917	USNM		f
	28	1928	ANSP		e

N=4

Bond (1928) considered them common (the 28 April 1928 spec. above is an albino female). There was one return among the inds. banded by Woods (1985). Observed as late as 25 April 1927 (W&S). Listed by Cory (1881) and Ridgway (1902).

Tortue - Spec. reported (not located), 1 Feb. 1917 (W&S). Observed by Bond (1928).

Gonave - 11 specs.: 9 from 25 Feb.-9 March 1929 (USNM; W&S) and 2 from 22, 24 March 1959 (PM). Observed by Bond (1928).

Gran Cayemite - 2 specs.: 10 Jan. 1918 (USNM; W&S) and 13 April 1930 (USNM; Wetmore 1932).

Navassa - Observed in Oct. 1928 (Ekman 1929, W&S).

Dominican Republic - 39 specs.:

	day	year	mus.	nos.	ref
Oct.	9	1883	BMNH		
	12-28	1916	AMNH	2	f
	"	"	USNM		f
	20	1963	LSU		
N=5					
Nov.	22-30	1916	AMNH	3	f
N=3					
Dec.	7	1973	MNHN		
	22-26	1906	AMNH	3	
	31	1891	FM		
N=5					
Jan.	3-23	1907	ROM	4	f
	"	"	AMNH		f
	12-14	1906	BMNH	3	
	31	1976	MNHN		
N=9					
Feb.	1-19	1907	ROM	4	f

	12	1895	FM		c
N=5					
March	16	1907	ROM		
	16-27	1895	FM	9	c
	21	1884	BMNH		
N=11					
April	7	1919	USNM		f
N=1					

Additional specs. (not located): 28 Jan. 1895 (Christy 1897), 12 May and 19-21 Oct. 1928 (W&S), and several more from April 1917 (W&S). Peters (1917) observed it regularly until 15 March, less so thereafter, and for the last time on 10 April 1916. Considered "tolerably common" by Cherrie (1896) and an abundant migrant by Verrill and Verrill (1909). Dod (1981) considered it common close to the ground in semi-open areas in dry or semi-arid woods. Listed by Sclater (1857) and Hellmayr (1935). CBC: 6/11 counts (total - 18 inds.).

Isla Saona - Observed, 5-7 April 1974 (Faaborg 1980).

[Dendroica castanea - Bay-breasted Warbler.]

Dominican Republic - Sighting, Oct. 1980 (either or both the 8th as in Norton 1981, or the 12th as in Bond 1982).

Dendroica striata - Blackpoll Warbler.

Gonave - Sighting, of a small band, 15 May 1928 (Bond 1928 saw these and commented that a male was in full song; also in W&S, Bent 1953).

Ile a Vache - 2 specs. (not located), 2 and 6 May 1930 (Wetmore 1932). Sighting, 27-28 April 1931 (Wetmore and Lincoln 1933 reported that several of these were heard singing).

Dominican Republic - 19 specs.:

	day	year	mus.	nos.	ref
Sept.	27	1963	LSU		
N=1					
Oct.	3-21	1963	LSU	8	
	5,10	1916	AMNH	2	
	8-22	1922	AMNH	3	f
	14	1973	MNHN		
N=14					
Nov.	2	1975	MNHN		
N=1					
May	2	1974	MNHN	2	
	11	1976	MNHN		

N=3

Additional specs. (not located): 6 from 27 Sept.-23 Oct. 1928 (W&S; an early fall date in Bent 1953); 1 on 11 May (Bond 1974; perhaps the 2 May 1974 spec. above?). Sightings: 27 Sept.-21 Oct. 1963 (Schwartz and Klinikowski 1965 considered this the most common migrant warbler in

scrub and mesic woods during this period) and 22 Oct. 1978 (Bond 1982). Dod (1981) noted it as uncommon from Sept.-Dec. and March-June. CBC: 6 inds. in 3/11 counts; Norton (1987) noted the 18 Dec. 1986 report; others in 1975 and 1985 counts. Because essentially all Blackpoll Warblers are on their South American wintering grounds by late Dec., these CBC reports must be considered questionable.

Isla Beata - 1 spec., 22 Oct. 1978 (MNHN). 1 ind. netted and 2 others seen, 27 July 1977 (!) (Bond 1982).

Mniotilta varia - Black-and-white Warbler.

This species "may occur anywhere through the island where there is suitable tree growth" (W&S). Terborgh and Faaborg (1980) observed it in pine forests and sclerophyll scrub. Cory (1885) considered it not uncommon, generally near the coast. Listed by Cory (1892).

Haiti - 13 specs.:

	day	year	mus.	nos.	ref
Jan.	11-19	1929	USNM	3	f
N=3					
Feb.	25	1881	FM		
	25,27	1929	USNM	2	f
N=3					
March	7	1886	USNM		f
	21-24	1929	USNM	3	f
N=4					

April	6,7	1930	USNM	2	g
	20	1927	USNM		f

N=3

Additional spec. (not located): 13 April 1866 (W&S).
 Observed in March 1931 (Wetmore and Lincoln 1933). Inds.
 were banded by Woods (1975). Listed by Bryant (1866), Cory
 (1881), Bond (1928, as common), and Hellmayr (1935).

Tortue - Noted by Abbott (in W&S)

Gonave - 4 specs.: 3 from 12 March 1929 (USNM; W&S) and
 1 from 13 Jan. 1980 (USNM). Observed by Bond (1928).

Ile a Vache - One spec. reported (not located), 6 May
 1930 (Wetmore 1932; a late date in Bent 1953).

Navassa - Observed on or shortly after 17 Oct. 1928
 (Ekman 1929, W&S).

Dominican Republic - 38 specs.:

	day	year	mus.	nos.	ref
Sept.	17,24	1963	LSU	2	
	27	1916	AMNH		f

N=3

Oct.	4	1916	AMNH		
	12-28	1922	AMNH	4	

N=5

Nov.	11	1916	AMNH		
------	----	------	------	--	--

N=1

Dec.	23	1906	AMNH		
------	----	------	------	--	--

N=1

Jan.	3	1924	BMNH		
------	---	------	------	--	--

	6-31	1907	AMNH	2	f
	"	"	ROM	2	f
	15	1922	AMNH		
	22-28	1895	FM	5	c
N=11					
Feb.	3	1917	AMNH		d
	4-28	1907	ROM	3	f
	22,26	1895	FM	2	c
	26	1922	USNM		f
N=7					
March	4	1916	MCZ		
	6,9	1907	ROM	2	f
	7	1919	USNM		f
	17	1895	FM		c
	24,26	1922	AMNH	2	
N=7					
April	21	1895	FM		c
N=1					
May	15	1922	BMNH		
N=1					
undated	?	1884	BMNH		a
N=1					

Additional specs. (not located): 29 Sept. and 7 and 25 Oct. 1928 (W&S). Dod (1981) listed them as common wherever there are trees. Listed by Sharpe (1885), Verrill and Verrill (1909, as an abundant migrant), and Hellmayr (1935). CBC: 8/11 counts (max. number - 5 inds.).

Isla Saona - 8 netted, 5-7 April 1974 (Faaborg 1980).

Cayo de Levantado - 1 spec., 14 Feb. 1907 (ROM; W&S).

Setophaga ruticilla - American Redstart.

This numerous species frequents shrubbery, groves, and forests everywhere from coastal thickets to the summits of mountains (W&S). It has been observed in pines and various sclerophyll habitats (Terborgh and Faaborg 1980). Penard (1926) observed an ind. on board a ship north of Hispaniola on 27 Oct. 1921. Listed for the island by Cory (1885, 1892).

Haiti - 20 specs.:

	day	year	mus.	nos.	ref
Dec.	1	1928	FM		
N=1					
Jan.	11-19	1929	USNM	3	f
	23,29	1881	FM	2	
	27	1918	USNM		
N=6					
Feb.	16-19	1881	FM	3	
	19	1929	USNM		f
N=4					
March	1	1933	MCZ	2	
	24,26	1929	USNM	2	f
N=4					
April	8	1931	USNM		
N=1					

May 9,10 1886 USNM 3 f

N=3

unknown BMNH

N=1

Additional specs. (not located): 1 from 1895 (Christy 1897), 1 from 18 April 1930 (from Bug Island, Wetmore 1932), and 1 each from 8 and 19 April 1931 (Wetmore and Lincoln 1933). Observed as late as 6 May 1931 (Wetmore and Lincoln 1933). Inds. banded by Woods (1975). Cory (1881) and Bond (1928) considered it abundant. Listed by Bryant (1866), Salvin and Godman (1881), and Hellmayr (1935).

Gonave - 10 specs.: 8 from 4-10 March 1929 (USNM; W&S) and 2 from 23,24 March 1959 (PM). Sighting, 20 May 1928 (Bond 1928, the last migrant warbler seen that spring; a late date in Bent 1953 and W&S).

Petite Cayemites - 3 specs., 15-16 April 1930 (USNM).

Navassa - 9 specs., all 21 Oct. 1965 (UF). Observed on or shortly after 17 Oct. 1928 (Ekman 1929).

Ile a Vache - 2 specs., 1,2 May 1930 (USNM).

Dominican Republic - 83 specs.:

	day	year	mus.	nos.	ref
July	20	1972	MNHN		
N=1					
Aug.	9	1923	AMNH		
	25	1981	USNM	2	
N=3					
Sept.	22	1916	USNM		f

	27	"	AMNH		f
N=2					
Oct.	11	1977	MNHN		
	12	1972	MNHN		
	12-24	1916	AMNH	3	f
	20, 27	1975	MNHN	2	
	26	1976	MNHN		
N=8					
Nov.	11, 23	1916	AMNH	2	f
	22	1923	BMNH		
N=3					
Dec.	2	1972	MNHN	2	
	19	1921	AMNH		
	22-27	1906	AMNH	4	
	"	"	ROM		
	30	1920	BMNH		
N=9					
Jan.	1	1924	BMNH	2	
	2, 6	1974	MNHN	2	
	4-30	1907	ROM	10	f
	12	1884	BMNH		a*
	14	1922	AMNH		
	22-28	1895	FM	4	
	31	1976	MNHN		
N=21					
Feb.	1-19	1907	ROM	9	f
	15-25	1895	FM	5	c

	?	1884	BMNH		a*
N=15					
March	2-31	1895	FM	9	c
	5,30	1916	MCZ	2	d
	15,26	1922	AMNH	3	
	16	1907	ROM		
N=15					
April	4	1916	MCZ		d
	4-24	1895	FM	3	c
	9	1922	AMNH		
N=5					
May	3	1895	FM		
N=1					

* - Sharpe 1885

Additional specs. (not located): 3 from 23 Oct.-29 Nov. 1928 (W&S). The 22 Sept. spec. above was listed as an early date by W&S and Bent (1953). Sightings: April (Norton 1980) and 3 Sept. 1984 (Norton 1985). Peters (1917) considered them not common on the north coast. Verrill and Verrill (1909), however, noted that they were abundant during migrations. Dod (1981) considered them abundant wherever there were woods. Listed by Sclater (1857), Bryant (1866), and Hellmayr (1935). CBC: The second most common warbler (mean = 7.5 inds./count).

Isla Beata - 12 inds. netted, 5-7 May 1974 (Faaborg 1980).

Isla Catalina - Sighting, Aug. 1963 (Schwartz and Klinikowski 1965).

Isla Saona - 9 inds. netted, 5-7 April 1974 (Faaborg 1980).

Siete Hermanos - 1 spec., 25 April 1985, Isla Cabritos (MNHN). Obs., Oct. 1963 (Schwartz and Klinikowski 1965).

Protonotaria citrea - Prothonotary Warbler.

Dominican Republic - 1 spec. reported, 10 Oct. 1975 (not located; Bond 1976). Ind. netted, 17 April (Bond 1978). Dod (1981) listed it as rare in mangroves.

Helmitheros vermivorus - Worm-eating Warbler.

Haiti - 1 ind. banded, 4 Jan. 1974 (Woods 1975).

Dominican Republic - 1 spec., 14 Nov. 1916 (AMNH). Additional spec. reported (not located), 24 Sept. (Schwartz and Klinikowski 1965 and Woods 1975 indicated that this was the first Hispaniolan record). 3 inds. netted, 22-23 Jan. (Bond 1971). Dod (1981) considered it uncommon in forest interiors.

Seiurus aurocapillus - Ovenbird.

W&S summarized early accounts of this species; they found it on the ground "in thickets and scrubs in both humid and arid sections." Inds. were seen in sclerophyll scrub by Terborgh and Faaborg (1980). Cory (1885) considered it common in winter. Penard (1926) observed an ind. on board a

ship north of Hispaniola on 27 Oct. 1921. Listed by Cory (1892).

Haiti - 19 specs.:

	day	year	mus.	nos.	ref
Nov.	24	1917	USNM		f

N=1

Jan.	11	1929	USNM		f
	15-29	1881	FM	3	

N=4

Feb.	26	1959	PM		
------	----	------	----	--	--

N=1

March	11	1881	FM		
	21-25	1929	USNM	3	f
	31	1930	USNM		g

N=5

April	15	1931	USNM		h
	20-26	1927	USNM	5	f
	23	1930	USNM		g

N=7

undated	?	1929	USNM		
---------	---	------	------	--	--

N=1

W&S reported it from sea level to the tops of the mountains. Bond (1928) considered it an abundant migrant. Several inds. were banded by Woods (1975). Listed by Bryant (1866), Cory (1881), and Hellmayr (1935).

Tortue - 2 specs., 2 and 7 Feb. 1917 (USNM; W&S).

Gonave - 4 specs.: 1 from 20 Feb. 1918 (USNM; W&S), 2 from 8-10 March 1929 (USNM; W&S), and 1 from 13 Jan. 1980 (USNM). Observed by Bond (1928) as late as 18 May 1928 (a late date in Bent 1953).

Petite Cayemite - 4 specs.: 14-15 April 1930 (USNM; Wetmore 1932)

Navassa - Observed on or shortly after 17 Oct. 1928 (Ekman 1929).

Ile a Vache - Sighting, 30 April 1931 (Wetmore and Lincoln 1933; a late date in Bent 1953).

Dominican Republic - 86 specs.:

	day	year	mus.	nos.	ref
Sept.	14	1883	BMNH		
	27-29	1916	AMNH	3	f
N=4					
Oct.	5	1987	MNHN		
	12,20	1972	MNHN	3	
	19	1975	MNHN	2	
	20	1963	LSU		
	20,23	1974	MNHN	4	
	28	1981	MNHN		
N=12					
Nov.	6	1975	MNHN	3	
N=3					
Dec.	23	1906	ROM		f
	23	1968	LSU		
N=2					

Jan.	2	1921	AMNH		
	7	1931	ROM		
	16-31	1907	ROM	6	f
	"	"	AMNH	4	f
	21-29	1895	FM	5	c

N=17

Feb.	2-20	1907	ROM	15	f
	3	1985	MNHN		
	13-21	1895	FM	5	c
	17	1919	USNM		f
	25	1975	MNHN		
	26,28	1916	MCZ	2	d

N=25

March	2-27	1895	FM	7	c
	7-23	1916	MCZ	4	d
	18	1907	ROM		f

N=12

April	1-21	1895	FM	9	c
	4	1916	MCZ		d

N=10

undated	?	?	MNHN		
---------	---	---	------	--	--

N=1

Additional specs. (not located): 19 April 1895 (Christy 1897, W&S; not among the 1-21 April Cherrie series of that year) and several from Nov. 1925 and Oct. 1928 and 1929 (W&S). Peters (1917) felt that it became more abundant on the north coast from mid-March through mid-April, presumably

due to a migratory influx. Verrill and Verrill (1909) considered it abundant during migration. Dod (1981) considered it abundant on the ground within thickets. Bernstein (1965) found fossil bones from a presumed late Pleistocene stratum of a cave deposit. Listed by Sclater (1857), Bryant (1866) and Hellmayr (1935). CBC: 9/11 counts (mean = 5.0 inds./count).

Isla Saona - 10 inds. netted, 5-7 April 1974 (Faaborg 1980).

Siete Hermanos - Sighting, Oct. 1963 (Schwartz and Klinikowski 1965).

Seiurus noveboracensis - Northern Waterthrush.

This species "is found in Hispaniola on muddy shores in the lowlands, principally in localities where the water is brackish or salt" and "is most common among mangroves" (W&S). Penard (1926) observed an ind. on board a ship north of Hispaniola on 27 Oct. 1921.

Haiti - 4 specs.: 8 and 19 Feb. 1929 (USNM; W&S) and 27 March and 1 April 1927 (USNM; W&S collected the latter plus another ind. on 27 April, probably referring to the spec. labelled 27 March; I do not know which date is correct). Bryant (1866) referred to Haiti spec(s?). Sightings: 21, 22 April 1917, 29 March and 3 April 1927 (all in W&S). Bond (1928) considered it "common on the borders of mangrove swamps and lagoons."

Tortue - 1 spec., 1 Feb. 1917 (USNM; W&S).

Gonave - 1 spec., 4 March 1920 (USNM; W&S). Observed by Bond (1928).

Petite Gonave - 1 spec., 19 March 1930 (USNM; Wetmore 1932).

Gran Cayemite - 1 spec., 13 April 1930 (USNM; Wetmore 1932).

Ile a Vache - 1 spec., 6 May 1930 (USNM; Wetmore 1932; a late date in Bent 1953).

Dominican Republic - 25 specs.:

	day	year	mus.	nos.	ref
Aug.	14	1923	AMNH		
N=1					
Sept.	11,12	1963	LSU	3	
N=3					
Oct.	3-15	1916	AMNH	3	
	11	1975	MNHN		
	11-22	1922	AMNH	3	h
	17	1963	LSU		
N=8					
Nov.	2	1976	MNHN		
	26	1922	AMNH		
	30	1966	LSU		
N=3					
Dec.	30	1906	AMNH		
N=1					
Jan.	8,16	1907	AMNH	2	
N=2					

Feb.	4-20	1907	AMNH	4	h
	17	1916	MCZ		d
	24	1895	FM		c

N=6

March	16	1895	FM		c
-------	----	------	----	--	---

N=1

Additional specs. (not located): 4 Sept., 9 and 23 Oct. 1928 and 1 Oct. 1929 (W&S). Sighting, 1 Sept. 1984 (Norton 1985). Noted as uncommon in mangroves by Dod (1981). Listed by Bryant (1866), Verrill and Verrill (1909), and Hellmayr (1935). CBC: Reported in 1980 and 1986 (1 ind. each count).

Isla Saona - Observed 5-7 April 1974 (Faaborg 1980).

Cayo Levantado - 3 specs., 14-16 Feb. 1907 (ROM; W&S).

Seiurus motacilla - Louisiana Waterthrush.

This species is "found principally along little fresh water streams but comes to salt water during its migration movements" (W&S). Listed from Hispaniola by Cory (1892).

Haiti - 4 specs.: 25 July 1962 (LSU), 21 Feb. 1911 (USNM), 2 March 1881 (FM; Cory 1881 noted 2 specs., but Cory 1885 listed just this 1; also in W&S, Hellmayr 1935), and 2 April 1927 (USNM; W&S; a late date in Bent 1953).

Additional spec. (not located): 26 Feb. 1866 (W&S). Bond (1928) considered it common along streams. Listed by Ridgway (1902) and Cooke (1904).

Gonave - Observed by Bond (1928); also in W&S.

Dominican Republic - 17 specs.:

	day	year	mus.	nos.	ref
Aug.	9-24	1923	AMNH	4	
	12,14	1883	FM	2	b
	"	"	BMNH		
N=7					
Nov.	17	1882	FM		b
N=1					
Jan.	14	1907	AMNH		
	18,24	1917	AMNH	2	
	22	1895	FM		c
N=4					
Feb.	6-20	1907	AMNH	2	f
	"	"	ROM		
	24	1977	MNHN		
N=4					
March	6	1976	USNM		
N=1					

Sighting, 29 July (Norton 1984). Verrill and Verrill (1909) considered both waterthrushes common, but noted this species only near salt and the Northern only near fresh water. It would seem that they had the species confused. Cherrie (1896) considered it rare. Dod (1981) noted it as common by fresh water from Aug. to May. Listed by Hellmayr (1935). CBC: 4/11 counts (total - 8 inds.).

Oporornis formosus - Kentucky Warbler.

Dominican Republic - 1 spec. reported (not located), undated (Bond 1976). Sighting, 4 Oct. 1963 (Schwartz and Klinikowski 1965). Listed as rare by Dod (1981). CBC: 1 ind. reported in 1986 count.

Oporornis agilis - Connecticut Warbler.

Dominican Republic - 2 specs.: 6 Oct. 1975 (MNHN) and 18 Oct. 1916 (AMNH). 2 additional specs. (not located), 11 Oct. and 2 Nov. 1975 (Bond 1976; it seems likely that one of these is the 6 Oct. spec. with an incorrect date). Listed as rare by Dod (1981).

Oporornis philadelphia - Mourning Warbler.

Dominican Republic - 1 spec., 14 Oct. 1974 (MNHN). 1 additional spec. reported (not located), 15 Nov. 1975 (Bond 1976). Listed as rare by Dod (1981).

Geothlypis trichas - Common Yellowthroat.

This species occurs in weedy fields and on the borders of marshes in the lowlands and ranges widely into higher altitudes where there is suitable habitat (W&S). Cory (1885) considered it a common winter inhabitant of thickets and low ground. Penard (1926) observed an ind. aboard a ship at sea north of Hispaniola on 27 Oct. 1921. Listed by Cory (1892) and Hellmayr (1935).

Haiti - 15 specs.:

	day	year	mus.	nos.	ref
Jan.	5-14	1929	USNM	3	f

N=3

Feb.	8-27	1929	USNM	5	f
	18	1881	FM		

N=6

March	12	1918	USNM		f
	21	1929	USNM		f
	28	1930	USNM		g
	28	1931	USNM	2	h

N=5

April	14	1917	USNM		f
-------	----	------	------	--	---

N=1

Additional specs. (not located): 2 April 1917 and 27 April 1927 (W&S). Observed as late as 24 April 1931 (Wetmore and Lincoln 1933). Bond (1928) saw an ind. as late as 1 May 1928. 4 of the inds. banded by Woods (1975) were recaptured. Listed by Cory (1881) as common.

Tortue - Observed by Bond (1928).

Gonave - 12 specs.:

	day	year	mus.	nos.	ref
March	4-12	1929	USNM	8	f
	12	1920	USNM		f
	28	1959	PM		

N=10

undated ? 1898 AMNH 2

N=2

Observed by Bond (1928).

Navassa - Observed on or shortly after 17 Oct. 1928
(Ekman 1929, W&S).

Ile a Vache - Sighting, 28-29 April 1931 (Wetmore and
Lincoln 1933).

Dominican Republic - 59 specs.:

	day	year	mus.	nos.	ref
Sept.	3-30	1916	AMNH	3	f

N=3

Oct.	4-17	1916	AMNH	5	f
	12	1922	AMNH		

N=6

Dec.	30	1906	AMNH		
------	----	------	------	--	--

N=1

Jan.	1,4	1922	AMNH	2	
	4-10	1907	AMNH	4	

N=6

Feb.	2-28	1895	FM	8	c
	9-20	1907	ROM	3	f
	"	"	AMNH		f

N=12

March	2-29	1916	MCZ	3	d
	6-27	1895	FM	15	c
	15,25	1922	AMNH	2	

N=20

April	4-23	1895	FM	8	c
	8	1916	MCZ		d

N=9

May	2	1895	FM		c
-----	---	------	----	--	---

N=1

undated	?	?	MNHN		
---------	---	---	------	--	--

N=1

Additional specs. (not located): 19 April 1895 (Christy 1897; not in the above series that includes this date), Nov. 1925, 5 Nov. and 28 Dec. 1928, and in Feb. 1929 (W&S; the 5 Nov. spec. had been incorrectly noted previously from 5 June). Cherrie (1896) saw none in Jan. and then witnessed a steady increase in numbers that peaked in mid-March, at which time it "might have been said to be common," and remained high until 8 May 1895 (a late date in Bent 1953). Peters (1917) noticed an increase after 15 March 1916 and considered the species very common from 1-10 April. Dod (1981) listed it as common in herbaceous growth and short thickets. Listed by Verrill and Verrill (1909) as common. CBC: 10/11 counts (mean = 5.0 inds./count, max. = 18 inds.).

Microligea palustris - Green-tailed Ground Warbler.

This species was described by Cory (1884) on the basis of a series collected in Aug. 1883. It is limited in distribution to Hispaniola and Isla Beata. W&S observed birds of the nominate subspecies foraging fairly low to the ground in luxuriant cover "in the dense growth of damp

thickets and woodland that are found in sections of abundant rainfall." Cherrie (1896) found them in dense thickets, primarily near swamps. Bond (1943) found two nests with eggs on 31 May and 1 June; they were situated in dense brush near the ground. Listed by Ridgway (1902), Hellmayr (1935), and Bond (1950).

Haiti - 23 specs.:

	day	year	mus.	nos.	ref
Aug.	12	1962	LSU	2	
N=2					
Feb.	19,24	1959	PM	2	
N=2					
March	5-12	1959	PM	8	
	"	"	UF		
N=9					
April	12-14	1927	USNM	5	f
N=5					
May	1,31	1920	USNM	2	f
N=2					
June	17	1956	UMMZ		
	30	1962	LSU		
N=2					
unknown			MCZ		
N=1					

Additional specs. (not located): 3 in May or June 1928 (Bond 1928). The status of this species in Haiti was summarized by McDonald (1987), who noted that it had

previously been known only from the mesic mountainous southeast of the country, but that she observed inds. and collected a specimen many kilometers away in the arid northwest of Haiti; she suggested that the new population may be more closely related to the arid-dwelling M. p. vasta of the southwestern Dominican Republic than to the previously-known (and geographically closer) Haitian population (also in Bond 1986). Previously listed by Bond (1928, 1984) and W&S.

Gonave - 2 specs., from unspecified dates in 1898 (AMNH). As there is no other evidence that this species has ever occurred on (or even particularly close to) Gonave, I believe that these labels are in error.

Dominican Republic - 89 specs.:

	day	year	mus.	nos.	ref
July	2	1963	LSU		
	17	1978	PM	3	
N=4					
Aug.	11	1969	LSU		
	11-29	1981	USNM	5	
	24-29	1883	FM	6	bf
	"	"	AMNH		bf
	"	"	USNM		bf
	25	1974	MNHN		
	28	1885	FM		
	28,29	1972	PM	6	

N=22

Sept.	1	1972	MNHN		
	6	1974	MNHN		
	27	1916	USNM		f
	28	1916	AMNH		fh
N=4					
Oct.	5-17	1916	AMNH	7	fh
N=7					
Jan.	2	1977	LSU		
	3-27	1917	AMNH	16	f
	"	"	CM	2	f
	"	"	ROM		f
	23	1980	USNM		
	28	1979	MNHN	2	
	30	1932	USNM		
N=24					
Feb.	1,28	1917	AMNH	2	f
	3	1974	MNHN		
	11	1922	USNM		h*
	12	1895	FM	3	cf
	17	1979	MNHN	2	
	22	1977	MNHN		
N=10					
March	5	1917	AMNH		f
	30,31	1895	FM	2	cf
N=3					
April	16	1934	MCZ		
	16-19	1919	BMNH		

	"	"	MCZ		
	"	"	USNM		
	30	1895	FM		cf
N=5					
May	14	1973	MNHN		
	15	1974	MNHN		
	15,16	1975	MNHN	2	
	19	1931	USNM	2	h*
	21	1927	USNM		
N=7					
June	21	1922	AMNH		
N=1					
unknown			USNM	2	
N=2					

* - Wetmore and Lincoln 1931

Additional specs. (not located): 15 Sept. and 21 Oct. 1929 (W&S). Observed by Bond (1952, 1978). Listed by Sharpe (1885), Cory (1886, 1892), Verrill and Verrill (1909). CBC: 7/11 counts (total - 18 inds.). Wetmore and Lincoln (1931, 1933) collected birds from arid scrub of the Barahona Peninsula and adjacent Isla Beata that they described as M. p. vasta. Schwartz and Klinikowski (1965) described details of the mainland distribution of this subspecies. Dod (1981) considered this species common in dense thickets at high elevations as well as in dry sites near sea level (respectively referring, presumably, to the two subspecies).

Isla Beata - Inhabited by M. p. vasta (see discussion above). 12 specs., 11-17 May 1931 (8 in USNM, 2 in MCZ, 1 in BMNH, 1 in ROM; Wetmore and Lincoln 1931, 1933). 14 inds. netted, 5-7 May 1974 (Faaborg 1980).

Wilsonia citrina - Hooded Warbler.

Dominican Republic - 1 spec., 11 Nov. 1985 (MNHN).
Sightings: 23 Oct. 1963 (Schwartz and Klinikowski 1965), April 1976 (Bond 1978), and 18 Jan. (Bond 1980). Listed as rare in humid woods and mangroves by Dod (1981).

Isla Saona - 1 ind. netted, 5-7 April 1974 (Faaborg 1980; also in Bond 1976).

[Wilsonia pusilla - Wilson's Warbler.]

Dominican Republic - Sighting, 4 Nov. 1987 (Norton 1988).

Xenoligea montana - White-winged Warbler.

This species, limited in distribution to Hispaniola, was described by Chapman (1917) as Microligea montana. The subgenus Xenoligea was erected by Bond (1967) to accentuate the differences between this species and M. palustris. Lowery and Monroe (1968) and Bond (1968) concluded that the differences were sufficient to require generic separation between the species (each genus is monospecific). Early reports were summarized by W&S. This is a resident of the higher mountains, generally sympatric with but ranging in

more open thickets than Microligea palustris. This species also forages low in shrubbery, but not so near the ground as does Microligea; Bond (1928) commented that this species does not hop on the ground as does the other. A deserted globular nest with two eggs in a bush about 5 ft above the ground was supposedly of this species (Bond 1928). Bond (1943) had become less convinced of this identification in writing "the nest and eggs are unknown." Listed by Hellmayr (1935) and Bond (1950).

Haiti - 24 specs.:

	day	year	mus.	nos.	ref
Aug.	12	1962	LSU		
N=1					
March	2	1959	PM	7	
	"	"	UF		
N=8					
April	14	1927	USNM	4	f
	16-20	1931	USNM	6	
N=10					
June	2-22	1917	AMNH	3	f
	11	1928	PM		
	30	1962	LSU		

N=5

Additional specs. (not located): 4 from 7-19 Jan. 1928 (Bond 1928, W&S). Noted as fairly common in low trees in rain forest habitat (Wetmore and Lincoln 1933).

Dominican Republic - 40 specs.:

	day	year	mus.	nos.	ref
July	1-19	1963	LSU	3	
N=3					
Oct.	12	1974	MNHN		
N=1					
Jan.	12-18	1917	AMNH	11	f
	"	"	USNM	2	f
	"	"	BMNH		f
	"	"	CM		f
	"	"	FM		f
	"	"	MCZ		f
N=17					
Feb.	2-27	1917	AMNH	5	f
	"	"	BMNH	3	f
	"	"	CM		f
	"	"	FM		f
	"	"	UMMZ		f
	20	1977	MNHN		
N=12					
March	9	1917	AMNH		f
N=1					
April	20	1973	MNHN		
N=1					
May	18	1919	USNM		f
	19	1927	USNM	2	f

26 1969 LSU 2

N=5

Additional spec. (not located): Aug. 1929 (W&S). All Dominican Republic collecting sites are within a circle of about 25 km radius more or less centered at Constanza (La Vega Province). Bond (1978) also reported it as common on the south slope of the Sierra de Neiba, about 75 km WSW of Constanza. Dod (1981) considered it rare, perhaps due to habitat destruction, above 1200 m in the highest mountains. She wrote that although it lives where there are pines, the bird frequents thickets in the understory.

DISCUSSION

There are four species of warblers that breed on Hispaniola. Dendroica petechia inhabits mangroves along the coasts of the main and many outlying islands. Dendroica pinus, Microligea palustris palustris, and Xenoligea montana all occupy pine-dominated interior highlands. M. palustris vasta occurs in some xeric lowlands of the main island and Isla Beata.

There are reports of 31 species of migrants. The 13 of these that are regular are (from most to least common based upon total numbers of specimens) Dendroica tigrina (173), Dendroica caerulescens (135), Setophaga ruticilla (128), Seiurus aurocapillus (115), Dendroica discolor (100), Dendroica coronata (93), Geothlypis trichas (86), Parula

americana (84), Dendroica dominica (69), Dendroica palmarum (67), Mniotilta varia (56), Seiurus noveboracensis (37), and Seiurus motacilla (21). Dendroica striata (22 specs.) is a common transient. Specimens document the irregular or accidental occurrence of 11 other species. There are 5 or fewer specs. of Vermivora pinus, Dendroica magnolia, Dendroica virens, Dendroica fusca, Helminthos vermivorus, Oporornis agilis, Oporornis philadelphia, and Wilsonia citrina. There are specimens noted in the literature of Vermivora chrysoptera, Protonotaria citrea, and Oporornis formosus that I have not located. The remaining 6 species (Vermivora peregrina, Vermivora ruficapilla, Dendroica pensylvanica, Dendroica kirtlandii, Dendroica castanea, and Wilsonia pusilla) are listed on the basis of sight reports. Some of these appear to be well-documented; others should be considered strictly hypothetical.

LITERATURE CITED

- Abramson, I. J., W. J. Weiss, Jr., and A. Dod. 1974. First record of Blue-winged Warbler for Hispaniola. Amer. Birds 28:881-882.
- Bartsch, P. 1917. Additions to the Haitian avifauna. Proc. Biol. Soc. Wash. 30:131-132.
- Bent, A. C. 1953. Life histories of North American wood warblers. Bull. U.S. Nat. Mus. 203:1-734.
- Bernstein, L. 1965. Fossil birds from the Dominican Republic. Quart. J. Fla. Acad. Sci. 28:271-284.
- Bond, J. 1928. The distribution and habits of the birds of the Republic of Haiti. Proc. Acad. Nat. Sci. Phila. 80:483-521.
- _____. 1930. The resident West Indian warblers of the genus Dendroica. Proc. Acad. Nat. Sci. Phila. 82:329-337.
- _____. 1940. Check-list of birds of the West Indies. Acad. Nat. Sci. Phila. 184 p.
- _____. 1943. Nidification of the passerine birds of Hispaniola. Wilson Bull. 55:115-125.
- _____. 1950. Check-list of birds of the West Indies. 3rd ed. Acad. Nat. Sci. Phila. 200 p.
- _____. 1952. Second supplement to the check-list of birds of the West Indies (1950). Acad. Nat. Sci. Phila. 24 p.
- _____. 1967. Twelfth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 22 p.

- _____. 1968. Thirteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1971. Sixteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 15 p.
- _____. 1974. Nineteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1976. Twentieth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 14 p.
- _____. 1977. Twenty-first supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 16 p.
- _____. 1978. Twenty-second supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 20 p.
- _____. 1980. Twenty-third supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 14 p.
- _____. 1982. Twenty-fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 16 p.
- _____. 1984. Twenty-fifth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 22 p.

- _____. 1986. Twenty-sixth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 18 p.
- Bryant, H. 1866. A list of the birds of St. Domingo, with descriptions of some new species or varieties. Proc. Boston Soc. Nat. Hist. 11:89-98.
- Cassin, J. 1860. Catalogue of birds collected during a survey of a route for a ship canal across the Isthmus of Darien, by order of the Government of the United States, made by Lieut. N. Michler, of the U.S. Topographical Engineers, with notes and descriptions of new species. Proc. Acad. Nat. Sci. Phila. 13:132-144, 188-197.
- Chapman, F. M. 1917. Descriptions of new birds from Santo Domingo and remarks on others in the Brewster-Sanford collection. Bull. Amer. Mus. Nat. Hist. 37:327-334.
- Cherrie, G. K. 1896. Contribution to the ornithology of San Domingo. Field Mus. Ornithol. Ser. 1:1-26.
- Christy, C. 1897. Field-notes on the birds of the island of San Domingo. Ibis 1897:317-343.
- Cooke, W. W. 1904. Distribution and migration of North American warblers. USDA Div. Biol. Serv. Bull. 18. U.S. Dept. Agric., Washington, D.C. 142 p.
- Cory, C. B. 1881. List of the birds of Haiti, taken in different parts of the island between January 1 and March 12, 1881. Bull. Nuttall Ornithol. Club 6:151-155.

- _____. 1884. Descriptions of several new birds from Santo Domingo. Auk 1:1-5.
- _____. 1885. The birds of Haiti and San Domingo. Estes & Lauriat, Boston. 198 p.
- _____. 1886. The birds of the West Indies, including the Bahama Islands, the Greater and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Part 1. Auk 3:1-59.
- _____. 1892. Catalogue of West Indian birds, containing a list of all species known to occur in the Bahama Islands, the Greater Antilles, the Caymans, and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Publ. by the author, Boston. 163 p.
- Danforth, S. T. 1929. Notes on the birds of Hispaniola. Auk 46:358-375.
- Dod, A. S. 1981. Guia de campo para las aves de la Republica Dominicana. Publ. by the author, Santo Domingo, R.D. 254 p.
- Ekman, E. L. 1929. Plants of Navassa Island, West Indies. Arkiv for Botanik 22A:1-12.
- Faaborg, J. 1980. The land birds of Saona and Beata Islands, Dominican Republic. Carib. J. Sci. 15:13.
- Gochfeld, M. 1974. Status of the genus Vermivora (Aves, Parulidae) in the Greater Antilles with new records from Jamaica and Puerto Rico. Carib. J. Sci. 14:177-181.

- Griscom, L. 1923. Descriptions of apparently new birds from North America and the West Indies. Am. Mus. Novitates 71:1-8.
- Hellmayr, C. E. 1935. Catalogue of birds of the Americas and adjacent islands. Field Mus. Nat. Hist., Zool. Ser. 13: Part 8:1-541.
- Lowery, G. H., Jr., and B. L. Monroe, Jr. 1968. Family Parulidae. P. 3-93 in R. A. Paynter, ed., Check-list of birds of the world, Vol. 14. Harvard Univ. press, Cambridge, Mass.
- McDonald, M. A. 1987. Distribution of Microligea palustris in Haiti. Wilson Bull. 99:688-690.
- Moreno, A. 1940. Notas sobre ornitologia cubana. III. Nuevo record. Mem. Soc. Cubana Hist. Nat. 14:409.
- Nolan, V., Jr. 1978. The ecology and behavior of the Prairie Warbler Dendroica discolor. Ornithol. Monogr. 26:1-595.
- Norton, R. L. 1980. The nesting season: West Indies region. Amer. Birds 34:932-933.
- _____. 1981. The spring migration: West Indies region. Amer. Birds 35:866-867.
- _____. 1982. The winter season: West Indies region. Amer. Birds 36:334.
- _____. 1983. The spring migration: West Indies region. Amer. Birds 37:916-917.
- _____. 1984. The nesting season: West Indies region. Amer. Birds 38:1064-1065.

- _____. 1985. The autumn migration: West Indies region.
Amer. Birds 39:107-108.
- _____. 1987. The winter season: West Indies region. Amer.
Birds 41:334-335.
- _____. 1988. The autumn migration: West Indies region.
Amer. Birds 42:142-144.
- Penard, T. E. 1926. Warblers at sea. Auk 43:376-377.
- Peters, J. L. 1917. Birds from the northern coast of the
Dominican Republic. Bull. Mus. Comp. Zool. 61:389-426.
- _____. 1927. A revision of the Golden Warblers, Dendroica
petechia (Linne). Proc. Biol. Soc. Wash. 40:31-41.
- Ridgway, R. 1902. The birds of North and Middle America.
Part II. Bull. U.S. Nat. Mus. 50:1-834.
- Salvin, O. and F. D. Godman. 1881. Biologia Centrali-
Americana. Aves. Vol. I. Taylor and Francis, London.
512 p.
- Schwartz, A. 1969. Land birds of Isla Saona, Republica
Dominicana. Quart. J. Fla. Acad. Sci. 32:291-306.
- _____ and R. F. Klinikowski. 1965. Additional observations
on West Indian birds. Notulae Naturae 376:1-16.
- Sclater, P. L. 1857. Liste de oiseaux rapportes et
observees dans la Republique Dominicaine (ancienne
partie Espagnole de L'Ile St. Domingue ou d'Haiti), par
M. A. Salle, pendant son voyage de 1849 a 1851. Proc.
Zool. Soc. London 1857:230-232.
- Sharpe, R. B. 1885. Catalogue of birds in the British
Museum. Vol. 10. The British Museum, London. 682 p.

- Terborgh, J. W. and J. R. Faaborg. 1980. Factors affecting the distribution and abundance of North American migrants in the eastern Caribbean region. P. 145-155 in A. Keast and E. S. Morton, eds., Migrant birds in the Neotropics. Smithsonian Inst., Washington, D. C.
- Todd, W. E. C. and W. W. Worthington. 1911. A contribution to the ornithology of the Bahama Islands. Ann. Carnegie Mus. 7:388-464.
- Tristram, H. B. 1884. On a collection of San Domingo birds. Ibis 1884:167-168.
- Verrill, A. E. and A. H. Verrill. 1909. Notes on the birds of San Domingo, with a list of the species, including a new hawk. Proc. Acad. Nat. Sci. Phila. 61:352-366.
- Wetmore, A. 1929. Descriptions of four new forms of birds from Hispaniola. Smithsonian Misc. Coll. 81:1-4.
- _____. 1932. Birds collected in Cuba and Haiti by the Parish-Smithsonian Expedition of 1930. Proc. U.S. Nat. Mus. 81:1-40.
- _____ and F. C. Lincoln. 1931. A new warbler from Hispaniola. Proc. Biol. Soc. Wash. 44:121-122.
- _____ and _____. 1933. Additional notes on the birds of Haiti and the Dominican Republic. Proc. U.S. Nat. Mus. 82:1-68.
- _____ and B. H. Swales. 1931. The birds of Haiti and the Dominican Republic. Bull. U.S. Nat. Mus. 155:1-483.
- Woods, C. A. 1975. Banding and recapture of wintering warblers in Haiti. Bird-banding 46:344-346.

WARBLERS OF THE WEST INDIES

IX. CUBA

This is the ninth and last in a series of papers addressing the regional distribution and natural history of wood-warblers (Emberizidae:Parulinae) in the West Indies. In this text, the Isle of Pines (= Isle of Youth or Isla de la Juventud) is treated separately from Cuba and associated cays. Data sources have been specimens housed in museum collections and information from published literature.

Tables of specimens are used in the text in all cases in which there are more than a few specimens from either Cuba or the Isle of Pines. Each row represents one specimen unless otherwise indicated in the numbers column. Where the reference column is blank, the data herein constitute the first published reference to the specimen(s). Museum names are abbreviated as follows:

- AMNH - American Museum of Natural History
- ANSP - Academy of Natural Science of Philadelphia
- BMNH - British Museum (Natural History)
- CM - Carnegie Museum of Natural History
- COR - Cornell University
- DNHM - Delaware Natural History Museum
- FM - Field Museum of Natural History
- LSU - Louisiana State University Museum of Zoology
- MCZ - Museum of Comparative Zoology, Harvard

PM - Peabody Museum, Yale
ROM - Royal Ontario Museum
UF - Florida Museum of Natural History
UMMZ - University of Michigan Museum of Zoology
USNM - United State National Museum

I have been unable to acquire information concerning specimens housed in museums in Cuba.

References within the tables will be symbolized by the following letters:

a - Baird 1865
b - Sharpe 1885
c - Chapman 1892
d - Ridgway 1902
e - Bangs and Zappey 1905
f - Todd 1916
g - Wetmore 1932
h - Hellmayr 1935
i - Barbour 1943
j - Bond 1960
k - Schwartz and Klinikowski 1963

Results of the four Guantanamo Bay Christmas Bird Counts (CBC's) held from 1973-1976 are included.

SPECIES ACCOUNTS

Vermivora bachmanii - Bachman's Warbler.

6 specs.: 3 from 23-28 Sept. 1907 (2 in USNM, 1 in AMNH), and 1 each from 22 Nov. 1925 (PM), 5 Dec. 1912 (USNM), and 20 Jan. 1910 (USNM). Additional specs. (not located): 3 taken in 1942 (Stevenson 1972). Recorded by Gundlach (1855a, 1872). Sightings: 12 Feb. 1938 and 2 on 3 March 1940 (Ripley and Moreno 1980), 1 each in 1962, Feb. 1964, and 1966 (Garrido 1980, 1985), and 1 on 6 April 1980 (Ripley and Moreno 1980, Bond 1982). Hamilton (ms.) reported 8 previously unpublished sightings by various observers between 1977 and 1987. G&GM (1975) set extreme dates of 7 Sept.-16 March. Hamel (1986) summarized the scanty ecological notations of all these and other authors. He omitted a note that they are "fond of the cool streamsides and swamplands" where there are "flowers they probe for plant lice and nectar" by "hopping from vine to vine," eventually "resting on the canopy of vines whose garlands adorn the treetops and majestically dangle down to kiss the water surface" (Lembeye 1850, translated from Spanish by F. J. Vilella). Listed by Brewer (1860), Gundlach (1861), Baird (1865), Sharpe (1885), Cory (1892), Ridgway (1902), Cooke (1904), Hellmayr (1935), Bond (1950a), and Bent (1953).

Isle of Pines - Read (1909a, 1911b&c, 1913c) listed this on the basis of a spec. collected 6 Feb. 1909. Todd (1916) wrote that because the spec. was no longer in

existence, the species should be considered hypothetical. Read (1924) defended his identification of the spec. that was destroyed in a 1910 hurricane. Subsequently listed by Barbour (1943), Bond (1950a), Lowery and Monroe (1968), Stevenson (1972), and the American Ornithologists' Union (1983). Hamel (1986) pointed out the questionable nature of the above evidence.

Vermivora pinus - Blue-winged Warbler.

Specs. reported (not located): 21 Aug. 1964 (Bond 1965), 22 Oct. (G&GM 1975), Oct. 1970 (Garrido 1973), 27 Dec. 1951 (Bond 1952), and 10 April (Bond 1964). Sightings: 17 Sept. (G&GM 1975), 28 Nov. (Bond 1968), 5 Dec. (G&GM 1975), 4 March (Bond 1942), and 12 April (Bond 1964).

Vermivora chrysoptera - Golden-winged Warbler.

Specs. reported (not located): 10 Oct. 1937 (Bruner 1938-39, Bond 1942) and 2 in April (Gundlach 1872, Barbour 1943). G&GM (1975) noted 24 Sept., Dec. and 7 May sightings. Listed by Gundlach (1861).

Vermivora peregrina - Tennessee Warbler.

Specs. reported (not located): 14 Sept. 1964 and 9 Dec. 1964 (Bond 1965), 8 Dec. 1964 (Bond 1966, Gochfeld 1974; it is not clear whether the 8 and 9 Dec. records are of one or two birds) and 24 Oct. 1937 (Bruner 1938-39). Gundlach (1872) noted an April record (also in Bruner 1938-39,

Barbour 1943). Sightings: several in Oct. 1937, 1938, and 1939 (Bruner 1938-39, 1939) and 1 on 18 March 1968 (Dathe and Fisher 1969). Extreme dates of this transient have been listed as 13 Oct.-10 Nov. and 8 April-5 May by Bruner 1941 and Bent 1953 and 14 Sept.-14 Nov. and 31 March-5 May by G&GM 1975. The latter authors commented that it is more common in fall than in spring. Listed by Brewer (1860), Gundlach (1861, 1862), Cory (1886, 1892), Ridgway (1902), and Bond (1950a).

Isle of Pines - Noted from 20 Oct. (Read 1911a) and 4 Nov. 1909 (Read 1910b, 1913c). Todd (1916) wrote "Mr. Read writes that he secured a specimen, but as it is not now extant to authenticate his record, it is, I think, inadmissible under the circumstances." Read (1924) defended his identification of the spec. that had been destroyed in a hurricane. Listed by Bruner (1938-39) and Bond (1950a).

Vermivora ruficapilla - Nashville Warbler.

Spec. (not located), 9 Oct. 1963 (Bond 1964, 1965, G&GM 1965, 1975).

Parula americana - Northern Parula.

52 specs.:

	day	year	mus.	nos.	ref.
Aug.	15, 19	1955	PM	2	

	28	1959	LSU		
N=3					
Sept.	24	1932	FM		
	24, 28	1960	LSU	3	
N=4					
Oct.	2	1932	FM	2	
	19-30	1909	USNM	3	
	20	1908	USNM		
	27	1926	UMMZ		
N=7					
Nov.	1-30	1913	USNM	3	
	20	1925	PM	2	
	25	1911	USNM		
N=6					
Dec.	4	1901	UMMZ		
	5	1906	AMNH		
	5	1924	AMNH		
	9-15	1911	USNM	4	
	17	1913	USNM		
	20	1905	FM		
	20, 25	1959	LSU	2	
N=11					
Jan.	4	1912	USNM		
	12	1902	USNM		
N=2					
Feb.	18, 20	?	USNM	2	a
	22, 25	1915	MCZ	2	

	23	1904	BMNH		
	23	1948	USNM	2	
	24	1930	USNM		g
N=8					
March	1	1911	USNM		
	2	1915	MCZ		
	2,6	1930	USNM	2	g
	4,9	1948	USNM	2	
	5	1906	MCZ		
	29	1932	FM		

N=8					
April	2	1910	USNM		
	20	1909	USNM	2	

N=3

In addition, 2 specs. (UF) were collected on 24 Oct. 1965 at 21°40' N 76°20' W, off the north coast of Cuba between it and the Ragged Islands. Additional specs. (not located): 31 July (Bond 1966) and one or more in the winter of 1891-92 (Cory 1892b). Sightings: 30 July (Bruner 1938-39), as early as 13 Aug. 1939 (Bruner 1939), Oct. 1970 (Garrido 1973), Dec. 1948-Jan. 1949 (Eaton 1953, in mixed-species flocks), Jan.-Feb. 1984 (Rodriguez and Garcia 1987, in littoral vegetation), Feb. 1970 (Varona and Garrido 1970), and April 1978 (Berovides et al. 1982). Listed from Aug. to April (Gundlach 1872), from 5 Sept.-28 April 1938 (Davis 1941), from 10 Aug.-4 May (Bruner 1938-39, 1941, Bent 1953), and from 31 July-14 May (G&GM 1975; they considered

it abundant). Barbour (1943) wrote that they "haunt the highest wood." Observed by Chapman (1892), Garrido and Schwartz (1968), Garrido (1980), and Garrido et al. (1986). Listed by Denny (1847), Gundlach (1855a, 1861), Brewer (1860), Salvin and Godman (1881), Cory (1892), Ridgway (1902), Cooke (1904), and Hellmayr (1935). Reported in each CBC (mean = 8.5 inds.).

Isle of Pines - 7 specs.: 5 from 25 Sept.-20 Nov. 1912 (CM; Todd 1916) and 1 each from 5 Oct. 1925 (PM) and 6 March 1902 (AMNH; Bangs and Zappey 1905). Listed by Poey (1851), Cory (1892), and Read (1909a, 1910a&b, 1911a,b&c, 1913c).

Dendroica petechia - migrant Yellow Warblers

1 spec., 29 April 1908 (AMNH). Additional specs. (not located): 17 Aug. 1960 (Schwartz and Klinikowski 1963), 3 Oct. 1963 (G&GM 1975), 3 from 23-25 Feb. 1965 (Garrido 1980; these dates suggest that these birds were overwintering rather than in transit), 10 April (Bond 1964 noted this as well as 13 Sept.-3 Oct. sightings), and 21 April 1933 (Villalba and Bruner 1939). Sightings, 3 and 10 Sept. 1939 (Villalba and Bruner 1939, Bruner 1939, Bent 1953). The records of Barbour (1943) of supposed mangrove warblers by an inland lake may have been of migrants (Bond 1969). G&GM (1975) listed this as a rare transient reported by 19-24 Aug., 3 Oct., and 21 April-8 May. Listed by Brewer (1860) and Cory (1892, as hypothetical).

Dendroica petechia gundlachi- Yellow Warbler (residents).

176 specs.:

	day	year	mus.	nos.	ref.
July	4-28	1960	LSU	5	
	28	1913	USNM		
	31	1955	PM		

N=7

Aug.	2,5	1911	USNM	2	
	3	1913	USNM		
	16	1909	USNM		
	17	1960	LSU		
	19-30	1930	USNM	9	
	20,30	1935	FM	3	
	21	1917	USNM	2	
	31	1955	PM	2	

N=21

Sept.	1-7	1930	USNM	42	
	1-24	1955	PM	12	
	14	1960	LSU	3	
	24	1917	MCZ	2	
	28	1911	USNM		

N=60

Oct.	3,10	1910	USNM	2	
	9,13	1955	PM	3	

N=5

Dec.	3	1925	PM		
	9	1908	USNM		

	16	1913	USNM		
	16	1915	USNM	4	
	30	1948	COR		
N=8					
Jan.	3	1949	COR		
	7	1927	USNM		
N=2					
Feb.	1	1913	USNM		
	21	1930	USNM		g
	27	1915	MCZ	5	
N=7					
March	2-21	1948	USNM	9	
	4	1930	USNM	5	g
	6-20	1915	MCZ	4	
	7	1916	USNM		
	10	1941	CM		
N=20					
April	3	1923	ANSP	2	
	5	1948	DNHM		
	"	"	USNM		
	9	1969	LSU	4	
	11, 13	1892	AMNH	3	
	16	1904	MCZ	4	
	16	1911	USNM	2	
	28	1908	USNM		
N=18					
May	10	1900	MCZ		

10-29	"	USNM	14
30	1913	USNM	3
"	"	COR	

N=19

June	4	1919	USNM	
	8	1927	USNM	
	12	1913	USNM	2
	13	1910	USNM	3
	17	1900	USNM	
	23	1960	LSU	

N=9

The earliest reports of Yellow Warblers from Cuba treated them taxonomically as identical to those on the mainland. Lembeye (1850) noted 2 specs. (not located) and nests in mangroves that contained 2 eggs. Gundlach (1855a) also noted birds from mangroves. Cassin (1860) indicated that Cuban and Hispaniolan birds were distinct from other Yellow Warblers and applied the name D. albicollis, erected earlier for Hispaniolan birds, to both populations. Gundlach (1861) listed D. albicollis in recognition of this. Lawrence (1862) examined specs. and confirmed the suspicions of Cassin and Gundlach; he still called the birds D. albicollis. Albrecht (1861) had already published some of Lawrence's notes. Baird (1865) examined specs. sent him by Gundlach (not located) and decided that they were distinct from Hispaniolan birds. In recognition of the collector, he named Cuban birds D. gundlachi. Gundlach (1872) summarized

this history. Reduction to subspecific status occurred in 1874 (Ridgway 1902). Chapman (1892) identified the birds he observed in mangroves as *D. p. gundlachi*. All subsequent authors have followed this nomenclature. Barbour (1943) wrote that it is "abundant wherever there are heavy high mangroves" and that "the whole life of the species is passed in the mangrove forests." It has been noted from various offshore cays by Wetmore (1932, Cayo Grande de Moa), Bond (1950b, Cayo Largo), Garrido and Schwartz (1969, Cayos Cantiles), Varona and Garrido (1970, Cayos de San Felipe), Garrido (1973, Cayo Real), G&GM (1975, in general), Acosta and Berovides (1984, Cayo Coco and Cayo Romano), and Garrido et al. (1986, Cayo Guajaba). Valdes Miro (1984) published scant notes concerning nidification. It has been listed by Brewer (1860), Cory (1892), Ridgway (1902), Peters (1927), and Hellmayr (1935). Reported in each CBC (mean = 3.25 inds.).

Isle of Pines - 30 specs.:

	day	year	mus.	nos.	ref
Sept.	23	1930	USNM	12	
	30	1912	CM	2	T
N=14					
Oct.	18-26	1912	CM	3	T
N=3					
Nov.	9,14	1912	CM	3	T
N=3					

March 23-30 1917 MCZ 7

N=7

April 2 1948 USNM 3

N=3

Read (1913c) considered it rare. Todd (1916) wrote that it was numerous in mangrove habitat, to which it is confined, on the southern part of the island. Bangs and Zappey (1905) did not observe any during their visit in March 1902. Listed by Poey (1851), Cory (1892), Peters (1927), Hellmayr (1935), Barbour (1943), and G&GM (1975).

Dendroica pensylvanica - Chestnut-sided Warbler.

One spec., 24 Sept. 1955 (PM; Ripley and Watson 1956). Additional specs. (not located): 2 May 1940 (Moreno 1940, Barbour 1943) and 4 from unstated dates in 1940 and 1941 (Bent 1953). Sightings: 3 Sept. (G&GM 1975, Bond 1977) and 29 Sept. 1940 (Bruner 1943). Noted as late in fall as 14 Oct. (Bond 1942) and 31 Oct. (G&GM 1975). Noted in spring from 2-11 May (Bond 1942) and from 20 April-11 May (G&GM 1975).

Isle of Pines - Spec. reported (not located), between 7-11 Oct. 1962 (Bond 1963).

Dendroica magnolia - Magnolia Warbler.

2 specs.: 15 March 1948 (USNM) and 18 April 1908 (USNM). Additional specs. (not located): Nov. 1916 (Bruner 1938-39), 2 from 4 May 1928 (Bruner 1938-39), and 13 May

(Bond 1958). There is also an April record (Gundlach 1872, Cooke 1904). Sighting, mid-Jan. 1966 (Garrido and Schwartz 1968). Bruner (1938-39) and Bent (1953) listed extreme dates of 3 Nov. and 4 May. G&GM (1975) expanded these to 10 Sept.-20 May and denoted the species an annual transient and rare winter resident. Barbour (1943) considered it an accidental vagrant. Observed by Garrido and Schwartz (1969) and Garrido (1980). Listed by Denny (1847), Gundlach (1855a, 1861), Brewer (1860), Cory (1892), and Ridgway (1902).

Isle of Pines - Observed, 12 Dec. 1908 (Read 1909a, 1911b&c, Todd 1916, Bruner 1938-39). Listed by G&GM (1975).

Dendroica tigrina - Cape May Warbler.

61 specs.:

	day	year	mus.	nos.	ref.
Sept.	24	1903	USNM		
N=1					
Oct.	1	1917	USNM	2	
	1	1960	LSU		
	6-22	1908	USNM	3	
	21	1909	USNM		
	22	1915	USNM		
N=8					
Nov.	2	1909	USNM		
	6	1913	USNM		
	14	1912	USNM	2	

	17	1915	USNM		
	21	1901	USNM	2	
	27	1908	USNM	2	
N=9					
Dec.	5,27	1903	USNM	5	
	7	1911	USNM	3	
	15	1913	USNM		
	16,17	1911	USNM	3	
	17	1901	USNM		
N=13					
Jan.	2,24	1904	USNM	2	
	8,19	1902	USNM	3	
	29	1916	USNM		
N=6					
Feb.	7	1949	USNM		
	12	1919	USNM		
	16	1907	BMNH		
	20	1914	USNM		
	22	1915	MCZ		
	24	1930	USNM		g
	25	1916	USNM		
	27	1864	MCZ		
	27	1912	USNM		
N=9					
March	2,4	1930	USNM	2	g
	8,20	1915	MCZ	5	
	8,27	1919	USNM	2	

22 1932 FM

N=10

April	1	1915	USNM	2
	16	1911	USNM	
	19,27	1908	USNM	2

N=5

Additional spec. (not located), undated (Baird 1865). Chapman (1892) and Bruner (1939) saw them only in March and April; Berovides et al. (1982) also reported April observations. Gundlach (1872) observed it up until May. Bruner (1938-39) listed extreme dates of 11 Oct.-29 April; Bruner (1941) and Bent (1953) extended these to 20 Sept.-4 May. G&GM (1975) considered them somewhat common between the extremes of 30 Aug.-17 May. Gundlach (1872) observed them associated with Hibiscus flowers, and Barbour (1943) noted that they feed on flowers. Eaton (1953) found them singly (as opposed to in flocks) about bromeliads or trees in flower in Dec. 1948-Jan. 1949. Observed by Garrido (1980) and Garrido et al. (1986). Listed by Gundlach (1855a, 1861), Brewer (1860), and Cory (1892). This was the second most common warbler in the CBC's (mean = 32.5 inds.)

Isle of Pines - Sighting, 25 March 1911 (Read 1913c). Todd (1916) wrote that "while its occurrence ... is entirely probable, Mr. Read's identification is unfortunately not susceptible of verification." Listed by G&GM (1975).

Dendroica caerulescens - Black-throated Blue Warbler.

70 specs.:

	day	year	mus.	nos.	ref.
Sept.	24	1960	LSU	10	k
N=10					
Oct.	1	1960	LSU	2	k
	6-16	1955	PM	5	
N=7					
Nov.	10	1908	USNM		
	10	?	USNM		
	12	1910	USNM		
	14,17	1913	USNM	3	
	17	1915	USNM		
	18,20	1925	PM	2	
	"	"	AMNH		
	30	1912	CM		
N=11					
Dec.	2-26	1901	USNM	3	
	"	"	AMNH	2	
	4	1906	AMNH		
	22,24	1959	LSU	2	
N=8					
Jan.	1	1915	USNM		
	18	1913	CM		
	24	?	USNM		
N=3					
Feb.	9	1917	USNM		

	10,28	1913	CM	2	
	11,12	1907	BMNH	4	
	11,21	1915	MCZ		
	"	"	USNM		
	14	1900	USNM		dh
	21	1948	USNM		
	23,24	1904	BMNH	2	
	25	1864	MCZ		
N=14					
March	1-6	1930	USNM	6	g
	4,8	1948	USNM	2	
	4,18	1932	FM	2	
	5	1915	MCZ	2	
	5	1916	USNM		
	7	1907	USNM		
	10	1913	USNM		
	11	1919	USNM		
	21	1904	AMNH		

N=17

Additional specs. (not located): 13 Nov., 21 Dec. 1860, 17 Jan., and 9 April (Baird 1865) and one or more from the winter of 1891-92 (Cory 1892b). Most records are of the nominate subspecies; *D. c. cairnsi* is also reported to occur. The specs. that have been assigned to this taxon were those collected on 14 Feb. 1900 (Ridgway 1902, Hellmayr 1935) and 1 Oct. 1960 (Schwartz and Klinikowski 1963). Barbour (1943) and Bond (1950a) commented on the occurrence

of cairnsi and G&GM (1975) added a 21 Nov. report. Barbour (1943), in reference to the nominate subspecies, noted that it is exceedingly common, early to arrive and late to leave. Bruner (1938-39) set extreme dates of 8 Sept.-7 May. He later extended the late date to 11 May (Bruner 1941) and Bent (1953), based upon Davis (1941) pushed the early date up to 2 Sept. G&GM (1975) considered the species common between extremes of 1 Sept.-14 May. Eaton (1953) reported that it joins mixed-species flocks, and Garrido et al. (1986) noted it from various habitats but particularly wooded areas. This species has been observed by Gundlach (1855a, 1861, 1872), Chapman (1892), Bruner (1939), Garrido and Schwartz (1968), Garrido (1980), and Berovides et al. (1982). Listed by Denny (1847), Brewer (1860), Salvin and Godman (1881), and Cory (1892). There were 6 inds. reported in the 1973 CBC and none in the 3 other counts.

Isle of Pines - 6 specs.: 1 on 14 Oct. 1925 (FM) and 5 from 4-29 March 1902 (AMNH; Bangs and Zappey 1905). Four additional specs. (not located) were collected for Todd (1916) as early as 30 Nov. 1912; he noted them as common low down in thick cover on wooded slopes and recorded them as late as mid-May. Read (1909a, 1911a,b&c, 1913c) considered it common and listed 8 Oct. as an early and 14 April as a late date. Listed by Poey (1851), Cory (1892), and Ridgway (1902).

Dendroica coronata - Yellow-rumped Warbler.

23 specs.:

	day	year	mus.	nos.	ref.
Nov.	18,26	1911	USNM	2	
	21,27	1915	USNM	3	
	25	1932	FM		
N=6					
Dec.	4,?	1915	USNM	2	
	7	1911	USNM	2	
	15	1913	USNM		
N=5					
Jan.	6,8	1912	USNM	2	
	6,18	1902	USNM		
	"	"	AMNH		
	15	1899	USNM		
N=5					
Feb.	11	1922	MCZ	2	
	24	1916	USNM		
N=3					
March	13	1948	USNM		
	22	1900	USNM		
N=2					
April	7	1948	USNM		
N=1					
undated	?	?	FM		
N=1					

Additional spec. (not located), 6 April 1929 (Bruner 1938-39). Gundlach (1855a, 1872) and Barbour (1943) noted the late arrival of this species in Nov. and its departure at the end of March. Bruner (1938-39) and Bent (1953) noted extreme dates of 17 Nov.-28 April. G&GM (1975) extended these dates to 18 Sept.-1 May but noted that birds are most numerous in late winter and that they are not seen at all in some years. Observed by Chapman (1892), Bruner (1939), and Garrido (1980). Listed Denny (1847), Brewer (1860), Gundlach (1861), Salvin and Godman (1881), and Cory (1892). A single ind. was noted in the 1976 CBC.

Isle of Pines - Included in listings by Read (1909b, 1910b, 1911b&c, 1913c) are 26 Oct. and 26 Nov. 1909 reports. Observed 21 and 23 March 1945 (Walkinshaw and Baker 1946). Listed by Todd (1916) and G&GM (1975).

Dendroica virens - Black-throated Green Warbler.

2 specs.: 21 Oct. 1955 (PM) and 17 Dec. 1938 (ANSP; Bond 1950a, 1961). Additional spec. (not located), undated (Garrido and Schwartz 1969). Gundlach (1855a, 1872) saw a bird in Jan. 1854 (also in Cooke 1904). Additional sightings: 30 Oct. 1938 (Bruner 1939) and April 1978 (Berovides et al. 1982). Bruner (1941) and Bent (1953) listed extreme dates of 30 Sept.-1 May; Bruner (1938-39) had earlier noted sightings in every month from Oct.-March. G&GM (1975) extended the extremes to 12 Sept.-6 May; they noted that it is rare in general, but more common in western

Cuba than elsewhere. Observed by Garrido and Schwartz (1968) and Garrido (1973, 1980). Listed by Brewer (1860), Gundlach (1861), Salvin and Godman (1881), Cory (1892), and Barbour (1943).

Isle of Pines - Spec. (not located), Jan. 1855 (Bangs and Zappey 1905). Reports (including a spec. since destroyed), 21-28 Oct. 1909 (Read 1910b). Todd (1916) wrote that Read had also communicated a 18 Nov. 1912 sighting. Listed by Poey (1851), Cory (1892), and Cooke (1904).

Dendroica fusca - Blackburnian Warbler.

Specs. reported (not located): one undated and another from 21 May 1926 (Bruner 1938-39), and one from 8 Dec. 1964 (Bond 1966). Sightings, 20-22 Sept. and 30 Oct. 1938 (Bruner 1938-39, 1939, Bent 1953). G&GM (1975) listed fall dates from 9 Aug.-14 Nov. and spring dates from 11 April-24 May (the latest date is in Bond 1977). Listed by Barbour (1943) and Bond (1950a).

Isle of Pines - Spec. reported (not located), 7-11 Oct. 1962 (Bond 1963). Sighting, 26 Oct. 1938 (Bruner 1938-39). Listed by Read (1909a, 1911b&c, 1913c) on the basis of a 8 Dec. 1908 sighting that Todd (1916) considered "doubtful." Listed by Bond (1950a) and G&GM (1975).

Dendroica dominica - Yellow-throated Warbler.

64 specs.:

	day	year	mus.	nos.	ref.
July	11	1913	USNM		
	17	1959	LSU		
N=2					
Aug.	9,25	1960	LSU	8	
	15	1913	USNM		
	24,29	1907	DNHM	5	
	27	1918	USNM		
	31	1955	PM		
	?	1883	ANSP		
N=17					
Sept.	2-19	1930	USNM	6	
	4-10	1907	USNM	3	
	7	1908	USNM		
	15	1917	USNM		
	17	1903	USNM		
	24	1955	PM		
N=13					
Oct.	7	1955	PM		
	15	1913	USNM		
	16	1932	FM		
	28	1926	UMMZ		
N=4					
Dec.	3	1901	UMMZ		
	21	1959	LSU		

	28	1906	USNM	
N=3				
Jan.	13	1912	CM	
	20	1879	USNM	
	25	1861	USNM	a
	29	1902	USNM	
N=4				
Feb.	1	1917	USNM	
	12	1913	USNM	
	13	1915	USNM	
	18	1900	USNM	
	20	1914	USNM	
	21	1907	BMNH	
	29	1916	USNM	
	?	1913	MCZ	
N=8				
March	3,18	1948	USNM	2
	4	1930	USNM	g
	6	1907	AMNH	
	6	1915	MCZ	
	7,10	1906	MCZ	2
	8	1892	FM	
	8	1905	UMMZ	
	16	1892	AMNH	c
	18	1932	FM	
	25	1941	CM	

27 1864 MCZ

N=13

Additional specs. (not located): one or more from the winter of 1891-92 (Cory 1892b), 16 Jan. 1861 (Baird 1865), 15 Nov. 1964 and 23 Feb. 1968 (G&GM 1975 identified these two as D. d. stoddardi [also noted by Bond 1969]; they commented that the nominate subspecies is common but that D. d. albilora also occurs). Bond (1942) and Barbour (1943) noted that this was the first migrant to reach Cuba and one of the earliest to leave. Published extreme dates have been 19 Aug.-1 April (Bruner 1938-39), 17 Aug.-9 April (Bruner 1941), 12 Aug.-15 April (Davis 1941), 11 July-15 April (Bent 1953), and 11 July-29 April (G&GM 1975). Bruner (1938-39) commented that, although this species occurs in a variety of habitats, it is the only warbler to frequent royal palms. Rodriguez and Garcia (1987) found this species in littoral vegetation. Also observed by Gundlach (1855a, 1872), Bruner (1939), Garrido (1980), and Berovides et al. (1982). Listed by Denny (1847), Brewer (1860), Gundlach (1861), Cory (1892), Ridgway (1902), and Hellmayr (1935). A total of 6 inds. were reported in 2/4 CBC's.

Isle of Pines - 18 specs.:

	day	year	mus.	nos.	ref.
Sept.	19-28	1912	CM	4	f
	23	1930	USNM		

N=5

Oct.	1,25	1912	CM	3	f
------	------	------	----	---	---

	4	1925	PM		
N=4					
Nov.	4, 18	1912	CM	2	f
N=2					
Dec.	7-18	1912	CM	3	f
N=3					
March	2-20	1902	AMNH	4	e
N=4					

Observed as early as 18 Sept. by Read (1909a, 1910b, 1911a&b, 1913b&c). Todd (1916) wrote that this species "seems to prefer to palms, keeping rather high up." Listed by Poey (1851), Cory (1892), Ridgway (1902), and G&GM (1975).

Dendroica pityophila - Olive-capped Warbler.

71 specs.:

	day	year	mus.	nos.	ref.
Aug.	13	1958	UF		
N=1					
Sept.	12-24	1955	PM	5	
	13	1960	LSU	3	
N=8					
Feb.	6, 7	1917	MCZ	2	
	?	1917	MCZ	9	
N=11					
March	5-24	1913	USNM	20	
	13	1900	USNM		

	26,30	1948	USNM	4	
N=25					
April	5	1894	AMNH		
	11-16	1900	USNM	4	
	"	"	MCZ		
N=6					
May	17-25	1909	USNM	3	
	"	"	AMNH	2	
	?	?	FM		
N=6					
June	10	1891	FM		
	16-20	1960	LSU	10	
N=11					
undated	?	?	FM	2	
	?	?	USNM		a
N=3					

This species was originally described from birds breeding in the pines of western Cuba by Gundlach (1855b). Ramsden (1911) discovered a disjunct population in pine habitat in eastern Cuba. Barbour (1943) and G&GM (1975) stressed its dependence on pine habitat. The species is absent from much apparently suitable habitat between the two disjunct populations as well as on the Isle of Pines. Garrido (1971) pointed out that pityophila only occupies Pinus cubensis and P. caribaea forests and not the other two species of pines widespread on these islands; this explains the peculiarities of distribution. P. caribaea is also the

species utilized by this bird in the remainder of its range in the Bahamas. Garrido (1971) also pointed out that the 2 disjunct Cuban populations and Bahaman birds are extremely similar in appearance and natural history. They all search for insects, apparently the only food utilized, in high and low branches as well as along the trunks of pine trees and on the ground underneath. The first nest described was located on 13 June on a small branch of a pine about 10 m above the ground and contained 2 young about ready to fledge (Bond 1942). Bond (1958) summarized data on 6 nests: they were found from 28 April-28 May in pines from 2-15 m above the ground and contained a maximum of 2 eggs. Valdes Miro (1984) found 6 more nests, all with 2 eggs, high in pines from March to May. This species has been considered a very close relative of Dendroica graciae (Bond 1958, 1986). Listed by Gundlach (1857, 1861, 1872), Brewer (1860), Albrecht (1861), Sharpe (1885), Cory (1886, 1892), Ridgway (1902), Bond (1930, 1950a), Hellmayr (1935), and Lowery and Monroe (1968).

Dendroica pinus

2 specs. reported (not located): 22 Oct. 1964 (Garrido and Garcia Montana 1965, 1975) and 8 Nov. 1965 (Bond 1966, Garrido and Garcia Montana 1975). Bond (1966) indicated that the measurements of the latter spec. indicated that it was of the nominate subspecies. If so, this would be the

only known record of the breeding subspecies of the southeastern United States in the West Indies.

Dendroica discolor - Prairie Warbler.

106 specs.:

	day	year	mus.	nos.	ref.
July	27-29	1960	LSU	4	k

N=4

Aug.	9-27	1960	LSU	7	
	14-31	1930	USNM	5	
	17	1955	PM	2	
	20	1915	USNM		
	21	1917	AMNH		
	21	1959	LSU		
	?	1883	ANSP	3	

N=20

Sept.	2	1919	USNM		
	2-30	1930	USNM	16	
	5-25	1913	USNM	5	
	16	1955	PM		
	24	1903	USNM		
	25	1917	USNM		

N=25

Oct.	7	1955	PM		
	13	1913	USNM		
	16	1908	USNM		

	21	1909	USNM		
N=4					
Nov.	1	1913	USNM		
	1-20	1915	USNM	3	
	7	1908	USNM		
	16,29	1912	USNM	2	
N=7					
Dec.	4,6	1925	PM	2	
	7	1918	USNM		
	10	1906	DNHM		
	14,?	1915	USNM	2	
	14,21	1901	USNM	2	
	21	1959	LSU	2	
N=10					
Jan.	24	1904	USNM		
N=1					
Feb.	9-21	1907	BMNH	5	
	18	1900	USNM		
	19	1915	MCZ	2	
	23,24	1904	BMNH	2	
	24	1930	USNM		g
N=11					
March	1	1864	MCZ		
	4	1930	USNM	2	g
	12,18	1948	USNM	2	
	15	1905	UMMZ		
	15-30	1892	AMNH	10	

"	"	ROM	2
18	1932	FM	
24	1915	MCZ	
26	1941	CM	

N=21

April	6,11	1892	AMNH	2
-------	------	------	------	---

N=2

undated	?	?	FM
---------	---	---	----

N=1

A spec. collected 1 Aug. (not located) has been referred to as D. d. paludicola (Bond 1950a, G&GM 1975); all others are presumably of the nominate subspecies. Lembeye (1850) noted a spec. in Gundlach's collection and Cory (1892b) collected one or more in the winter of 1891-92 (none located). Published extreme dates are 17 Aug.-8 May (Bruner 1941), 16 Aug.-19 April (Davis 1941), 16 Aug.-8 May (Bent 1953), and 20 July-13 May (G&GM 1975 noted that this is one of the first migrant warblers to arrive). Barbour (1943) considered it common in cultivated lands and tangled thickets. Eaton (1953) observed birds in mixed-species flocks. Nolan (1978) indicated that birds had been found in citrus groves, thickets, mangroves, upland woods, and on the borders of wooded streams. Observed by Gundlach (1855a, 1872), Chapman (1892), Bruner (1939), Bond (1950b), Garrido and Schwartz (1968, 1969), Varona and Garrido (1970), and Garrido (1973, 1980). Listed by Denny (1847), Brewer (1860), Gundlach (1861), Salvin and Godman (1881), Sharpe

(1885), Cory (1892), and Ridgway (1902). Reported in each CBC (mean = 8.5 inds.).

Isle of Pines - 24 specs.:

	day	year	mus.	nos.	ref.
Sept.	23	1930	USNM		
	26	1912	CM		f
N=2					
Oct.	1-22	1912	CM	3	f
	2	1925	PM		
N=4					
Nov.	4-22	1912	CM	4	f
N=4					
Dec.	3-19	1912	CM	6	f
N=6					
Jan.	17	1913	CM		f
N=1					
Feb.	8,13	1913	CM	2	f
N=2					
April	4-19	1913	CM	5	f
N=5					

Included in references by Read (1909b, 1910b, 1911a,b&c, 1913c) are observations on 24 Oct. 1909 and 7 Nov. According to Todd (1916) Read also saw a bird on 28 April 1915. Sightings, 14-23 March 1945 (Walkinshaw and Baker 1946). Todd (1916) noted their occurrence close to the ground in tracts of low scrub and brushy places (also in

Nolan 1978). Listed by Poey (1851), Cory (1892), Bangs and Zappey (1905), and G&GM (1975).

Dendroica palmarum - Palm Warbler.

84 specs.:

	day	year	mus.	nos.	ref.
Sept.	24	1960	LSU		
N=1					
Oct.	1	1960	LSU		
	6,7	1955	PM	2	
	11	1903	USNM		
	13-29	1913	USNM	3	
	16	1908	USNM		
	25	1912	USNM		
N=9					
Nov.	9	1913	USNM	2	
	10	1942	FM		
	12,21	1901	USNM	4	
	20-25	1915	USNM	5	
	?	1921	BMNH		
N=13					
Dec.	1-24	1915	USNM	4	
	4-16	1913	USNM	4	
	10	1921	MCZ		
	15	1912	USNM		
	20	1958	UF		
	22-31	1901	USNM	4	

	26	1904	BMNH		
N=16					
Jan.	3-29	1902	USNM	5	
	5	1915	USNM		
	10	1909	USNM		
	15	1899	CM		
	17	1861	USNM		
	18	1914	USNM		
N=10					
Feb.	10-21	1907	BMNH	7	
	12-28	1916	USNM	2	
	"	"	MCZ		
	18, 19	1915	MCZ	3	
	21, 25	1930	USNM	4	g
	21, 29	1948	USNM	2	
	23	1904	BMNH		
N=20					
March	7	1914	MCZ		
	7	1916	USNM		
	8	1905	UMMZ		
	9-21	1900	USNM	3	
	16-23	1915	MCZ	2	
	"	"	USNM		
	18	1948	USNM		
	22	1907	USNM		
	23	1892	ROM		

23,26 1941 CM 2

N=14

undated ? 1898 AMNH

N=1

Additional specs. (not located): ? Oct. 1859, 6 Nov. 1861, 14 Dec. 1863, and 27 Jan. ? (Baird 1865). Cory (1892a,b) noted one or more specs., identified as D. p. hypochrysea, that he collected in the winter of 1891-92 (noted by Hellmayr 1935 and Barbour 1943). With respect to D. p. hypochrysea, Bond (1950a) cautioned that "no further example has come to hand, and Cory's skin can not be located." All other references are to the nominate subspecies. Bruner (1938-39), Barbour (1943), and G&GM (1975) stressed that this is the most common winter warbler in Cuba. In a variety of localities, Chapman (1892), Bruner (1939), Garrido and Schwartz (1968), Garrido (1973, 1980), and Garrido et al. (1986) stressed the abundance of this species. Bond (1950b) and Eaton (1953) found them in open, grassy areas and Rodriguez and Garcia (1987) noted them from littoral vegetation. G&GM (1975) listed pastures, wooded areas, and gardens as preferred habitats. Eaton (1953) saw them primarily in single-species flocks of up to 10 individuals; Garrido and Schwartz (1969) found isolated groups of no more than 5 birds. "A large number of stomachs examined in Cuba contained seeds" (Bowdish 1903). Observed by Gundlach (1855a, 1872), Varona and Garrido (1970), and Berovides et al. (1982). Listed by Gundlach (1861) and

Ridgway (1902). Published extreme dates include 21 Sept.-26 April (Bruner 1938-39), 20 Sept.-4 May (Bruner 1941), 14 Sept.-6 May (Davis 1941), 20 Sept.-6 May (Bent 1953), and 19 Sept.-17 May (G&GM 1975). This was the most common warbler in CBC's (mean = 32.75 inds.).

Isle of Pines - 13 specs.:

	day	year	mus.	nos.	ref.
Sept.	30	1912	CM		f
N=1					
Oct.	3-25	1912	CM	4	f
	8,15	1925	PM	2	
	"	"	FM		h
N=7					
Nov.	14	1955	PM		
N=1					
Dec.	4,12	1912	CM	2	f
N=2					
Feb.	20	1913	CM		f
N=1					
April	17	1913	CM		f
N=1					

Read (1909a&b, 1910a,b&c, 1911a,b&c, 1913a,b&c) included reports of the nominate subspecies as early as 25 Sept. as well as in Oct., Nov., Jan., and March; he also noted sighting a bird he felt to be D. p. hypochrysea on 6 Oct. 1909. Todd (1916) suggested that Read's records of hypochrysea should, in the absence of additional information

be referred to the nominate form. Bond (1950a) also felt that reports of hypochrysea here were doubtful. Todd (1916) felt that the nominate form was possibly the most abundant wintering warbler and that it was found in scattered flocks, on or near the ground, in relatively open situations. Observed by Bangs and Zappey (1905). As a result of observations made on 13-27 March 1945, Walkinshaw and Baker (1946) wrote that this was "one of the most common birds on the island, often found in small flocks of from 5 to 18 individuals feeding in the low shrubbery and bathing in streams." Listed by Poey (1851), Cory (1892), and G&GM (1975).

Dendroica castanea - Bay-breasted Warbler.

Specs. reported (not located): 1 Nov. (Bond 1963), others undated (Bond 1967). Reported on 28 Sept., 23 Oct., and 20 April (Bond 1942; some of the undated specs. above may be from these dates). Sighting, 7 April 1955 (Bond 1956). G&GM (1975) included fall dates from 28 Sept.-6 Nov. and spring dates from 7 April-7 May. Listed by Bond (1950a).

Isle of Pines - Spec(s?). reported (not located), undated (Bond 1967). Listed by G&GM (1975).

Dendroica striata - Blackpoll Warbler.

One spec., 28 Oct. 1911 (USNM). Additional specs. (not located): a series collected 3-17 May (Bruner 1938-39) and

one noted by Garrido and Schwartz (1969). Gundlach saw and apparently collected specs. with some frequency in Nov. (Bruner 1938-39, Barbour 1943) and April (Gundlach 1872 specifically referred to many birds arriving from the south in April 1858; also in Barbour 1943). Lembeye (1850) noted a spec. in Gundlach's collection supposedly dated June. Bruner (1939) observed 14 individuals on 1 May 1978. Extreme spring dates have been reported as 29 April-6 May (Bruner 1938-39), 24 April-16 May (Bruner 1941, Bent 1953), and from April to 7 June (G&GM 1975). The latter authors considered this species rare in autumn (from 16 Sept.-9 Dec.) but abundant in spring. Garrido and Schwartz (1969) suggested that Blackpoll Warblers may use offshore cays more heavily than the main island during migration. Listed by Gundlach (1855a, 1861), Brewer (1860), Cory (1892), and Ridgway (1902). The reports of 2 inds. each in the 1974 and 1976 CBC's must be considered questionable.

Isle of Pines - 3 specs., 24 April-7 May 1913 (CM; Todd 1916, Bruner 1938-39). Read (1913b&c) observed birds in Sept. and later (Read 1924) defended his identification.

Dendroica cerulea - Cerulean Warbler.

One spec., undated (AMNH). Additional specs. (not located): 1 each from April (Gundlach 1872, Barbour 1943) and 4 Aug. (Bond 1966). G&GM (1975) recorded this as a very rare transient from 4 Aug.-18 Oct. and in April. Listed by Gundlach (1861, 1862), Cory (1886, 1892), and Bond (1950a).

Isle of Pines - Read (1911b&c, 1913c) included a 11 Feb. 1909 record. Todd (1916) wrote that as Read's specimen "is not now extant it seems better to leave the record for the present in the doubtful column." Read (1924) retorted that he had properly identified the specimen that had been destroyed in a 1910 hurricane. Bond (1951) had no reason to question the validity of Read's record. Nevertheless, in the absence of winter records from the West Indies for this species, one which normally winters in the Andes of South America, I feel that Read's record should be considered hypothetical.

Mniotilta varia - Black-and-white Warbler.

36 specs.:

	day	year	mus.	nos.	ref.
Aug.	9-25	1960	LSU	3	
	18	1955	PM	2	
	18,20	1917	AMNH	2	
	28	1959	LSU		

N=8

Sept.	1-24	1960	LSU	3	
	7	1930	USNM		
	13	1913	USNM		
	15	1921	USNM		

N=6

Oct.	1	1917	USNM		
	2,13	1932	FM	2	

	25	1979	USNM	
N=4				
Nov.	27	1906	AMNH	
N=1				
Dec.	2	1901	USNM	
	10-26	1926	AMNH	2
	"	"	DNHM	
	19	1958	UF	
N=5				
Jan.	17	1861	USNM	a
N=1				
Feb.	8, 27	1912	USNM	2
	10	1907	BMNH	
	21	1930	USNM	g
	22	1915	MCZ	
	?	1886	FM	
N=6				
March	17	1892	ROM	
	20	1948	USNM	
N=2				
April	4	1904	AMNH	
	6	1921	USNM	
N=2				
undated	?	1898	AMNH	
N=1				

Additional specs. (not located): 1 Aug. 1935 (Bruner 1938-39), one or more from the winter of 1891-92 (Cory

1892b), and 6 March 1930 (Wetmore 1932). Sightings: 3 April 1948 (Bond 1950b) and from 11-15 April 1978 (Berovides et al. 1982). Bruner (1938-39) listed extreme dates of 12 Aug.-10 May and added an offshore cay observation in mid-July. Bruner (1941) and Bent (1953) extended the late date to 25 May; G&GM (1975) listed extremes of 29 July-25 May. Noted from a variety of habitats, including mangroves (Varona and Garrido 1970, Garrido et al. 1986), littoral vegetation (Rodriguez and Garcia 1987), and woods and thickets (Barbour 1943). Eaton (1953) indicated that they could be found in mixed-species flocks. Observed by Gundlach (1855a, 1872), Chapman (1892), Bruner (1939), Garrido and Schwartz (1968, 1969), and Garrido (1973, 1980). Listed by Denny (1847), Brewer (1860), Gundlach (1861), Salvin and Godman (1991), Sharpe (1885), Cory (1892), Hellmayr (1935), and Olson (1985). Reported in each CBC (mean = 7.75 inds.).

Isle of Pines - 2 specs.: 14 Dec. 1912 and 27 Feb. 1913 (both CM; Todd 1916). Among reports by Read (1909a, 1910b, 1911a,b&c, 1913b&c) are 23 and 30 Aug., Sept. 20 Oct., and Dec. dates. It has been observed in March 1902 (Bangs and Zappey 1905) and from 17-23 March 1945 (Walkinshaw and Baker 1946). Todd (1916) noted the bird from woodlands (and once in mangroves) as late as 5 May. Listed by Poey (1851), Cory (1892), and G&GM (1975).

Setophaga ruticilla - American Redstart.

35 specs.:

	day	year	mus.	nos.	ref.
Aug.	1	1861	MCZ		
	21	1917	AMNH		
N=2					
Sept.	4	1861	USNM		a
	5	1913	USNM		
	6,8	1930	USNM	2	
N=4					
Oct.	6,8	1955	PM	2	
	13,15	1932	FM	2	
	21	1908	USNM		
N=5					
Nov.	23	?	USNM		
	29	1901	USNM		
N=2					
Dec.	2	1901	USNM		
	27	1911	USNM		
N=2					
Jan.	8	1902	USNM		
N=1					
Feb.	10	1907	BMNH		
	17	1915	USNM		
	19	"	MCZ		
	23	1904	BMNH		

	24	1930	USNM	g
N=5				
March	1	1930	USNM	g
	1-28	1948	USNM	5
	2	1915	MCZ	
	20	1932	FM	
	25,30	1941	CM	2
N=10				
April	16	1892	ROM	
N=1				
May	3	1905	BMNH	
	11	1900	USNM	2
N=3				

Additional specs. (not located): 5 Sept. 1861, 8 Dec., and undated (Baird 1865). Bruner (1943) wrote that "the North American observer would never dream that there could be enough Redstarts gathered together from the bird's range to make up the hordes which come to Cuba." Davis (1941) and Bent (1953) noted extreme dates of 6 Aug.-13 May. Bruner (1941) listed 7 Aug.-25 May but had earlier noted an offshore cay sighting on 29 July (Bruner 1938-39). G&GM (1975) noted that specs. had been collected in every month of the year. They have been noted from a variety of habitats including thickets and woods (Barbour 1943, Garrido et al. 1986) and mangroves (Varona and Garrido 1970). Eaton (1953) noted them in mixed-species flocks. Observed by Gundlach (1855a, 1872), Bruner (1939), Bond (1950b), Garrido

and Schwartz (1968), Garrido (1973, 1980), and Berovides et al. (1982). Listed by Denny (1847), Brewer (1860), Gundlach (1861), Salvin and Godman (1881), and Cory (1892). Reported in each CBC (mean = 4.25 inds.).

Isle of Pines - 6 specs.: 8 Oct., 9 Nov., and 3 from 5-14 Dec. 1912, and 9 Jan. 1913 (all CM; Todd 1916). Read (1909a, 1910a&b, 1911a,b&c, 1913a&c) included reports as early as 11 Oct. as well as in Nov., Feb., and March. Bangs and Zappey (1905) found them common in March 1902 and Walkinshaw and Baker (1946) observed several from 16-21 March 1945. Todd (1916) noted that they were very common and that the latest date reported was 25 April 1913. Listed by Poey (1851), Cory (1892), and G&GM (1975).

Protonotaria citrea - Prothonotary Warbler.

Specs. reported (not located): 6 Sept. (Bond 1960), 10 April (and another seen 12 April, Bond 1964), and April 1859 (Gundlach 1872, Cooke 1904; Barbour 1943 wrote that Gundlach had reported it several times, but always in April).

Sightings: 3 Aug. (G&GM 1975, Bond 1977), 26 Oct. (G&GM 1975), 26 and 27 Feb. 1968 (2 inds., Dathe and Fisher 1969), and 3 and 29 March (Bond 1950a). Bent (1953) listed spring extremes from 31 March-4 April; G&GM (1975) noted 28 Feb.-3 April limits. Listed by Gundlach (1861), Salvin and Godman (1881), Sharpe (1885), Cory (1886, 1892), and Ridgway (1902).

Isle of Pines - Read (1909a, 1911b&c, 1913c) based inclusion of this species on a spec. collected 25 Jan. 1909. Todd (1916) noted that the spec. was not preserved and that "there must be some mistake here" because the occurrence of the bird seemed to him so unlikely. Read (1924) defended his identification of the spec. that had been destroyed in a 1910 hurricane. Bond (1951) felt that there was no need to question Read's record.

Helmitheros vermivorus - Worm-eating Warbler.

8 specs.:

	day	year	mus.	nos.	ref.
Sept.	24	1913	USNM		
N=1					
Nov.	20,22	1925	PM	2	
	"	"	AMNH		
	30	1911	USNM		
N=4					
Jan.	18	1907	DNHM		
N=1					
Feb.	17	1911	USNM		
	17	?	USNM		a
N=2					

Additional spec. (not located) in Gundlach's collection, undated (Lembeye 1850). Another was wounded but not secured (Garrido 1973). Sighting, 3 April 1938 (Bruner 1939). Eaton (1953) observed birds in Dec. 1948-Jan. 1949

and found the bones of small lizards in the stomach of a spec. (if preserved, not located). Observed by Garrido (1980). Bruner (1938-39) knew of no fall reports. Bent (1953) listed 1 May as a late date. G&GM (1975) denoted it as relatively frequent in migration and rare in winter; they listed extreme dates of 18 Aug. and 5 May. Gundlach (1855a, 1872) and Barbour (1943) commented on its frequent association with Teretistris fernandinae; the latter author also commented that it forages in flocks and "climbs about vines and among the hanging dead palm leaves." Listed by Brewer (1860), Gundlach (1861), Salvin and Godman (1881), Cory (1886, 1892), and Ridgway (1902).

Isle of Pines - Read (1911b, 1913c) based his listing on a bird collected 9 Jan. 1910 (also in Todd 1916) and later defended his identification of the specimen that was destroyed in a 1910 hurricane (Read 1924).

Limnothlypis swainsonii - Swainson's Warbler.

There is an early April record (Gundlach 1872) and an undated spec. (not located) noted by Baird (1865) as having been collected by Gundlach. These probably represent a single bird (also in Bond 1942). Additional specs. (not located): 15 Sept. 1964 (Bond 1965), 25 Sept. of an unstated year (Meanley 1971), 18 Jan. 1914, collected by Ramsden (1914) feeding on the ground in dry leaves in heavy timber (also in Bond 1942, Bent 1953, Meanley 1971), and 14 April 1922 (Bruner 1938-39, Bond 1942, Meanley 1971). Eaton

(1953) apparently killed one or more birds from Dec. 1948-Jan. 1949 as he commented on small lizard bones found in a stomach; I do not know if these were preserved (also in Meanley 1971). Garrido (1973) examined 3 specs. (in addition to the above?) and felt that because birds, at least on Cayo Real, inhabit dry forest habitat rather than mangroves, they should be assigned to the alta subspecies that breeds in uplands in the United States rather than to the bottomland nominate subspecies. No justification was provided for this assignation. Sighting, Jan. 1988 (Norton 1988). Listed by Salvin and Godman (1881), Cory (1886, 1892), Ridgway (1902), Hellmayr (1935), Barbour (1943), Bond (1950a), and G&GM (1975).

Seiurus aurocapillus - Ovenbird.

42 specs.:

	day	year	mus.	nos.	ref.
Sept.	17	1955	PM		
	20	1913	USNM		
	24	1919	USNM		
	24	1960	LSU	4	

N=7

Oct.	11	1903	USNM		
	12,29	1913	USNM	2	
	16	1914	USNM		
	16	1932	FM		

N=5

Nov.	20	1915	USNM	
N=1				
Dec.	28,30	1948	COR	2
N=2				
Jan.	2	1907	AMNH	
	2,3	1949	COR	3
	3	1902	USNM	
	12	1916	USNM	
	13	1912	USNM	
	29	1949	USNM	
N=8				
Feb.	5,13	1949	USNM	2
	17	1908	BMNH	
	18	1915	MCZ	
	22	1915	MCZ	
	?	1886	FM	
	?	1913	MCZ	
N=7				
March	4-22	1948	USNM	6
	8	1919	USNM	2
	25	1907	USNM	
	31	1938	USNM	
N=10				
April	7	1948	USNM	
	27	1900	USNM	
N=2				

Additional specs. (not located): 11 Sept. 1938 (Bruner 1938-39), 4 Oct. 1973 (G&GM 1975), one or more from the winter of 1891-92 (Cory 1892b), and 18 Feb. (Baird 1865). Extreme dates in the literature are 11 Sept.-26 April (Bruner 1938-39), 10 Sept.-23 April (Davis 1941), 6 Sept.-12 May (Bruner 1941), 26 Aug.-26 April (Bent 1953), and 15 Aug.-24 May (G&GM 1975). Barbour (1943) noted it from woods, orchards, thickets, and coffee plantations. Eaton (1953) found them in upland woods, generally solitary and perhaps territorial; he found lizard bones in one stomach. Observed by Gundlach (1855a, 1872), Chapman (1892), Bruner (1939), Garrido and Schwartz (1968), Garrido (1977, 1980), and Berovides et al. (1982). Listed by Brewer (1860), Gundlach (1861), Cory (1892), and Hellmayr (1935). A total of 4 inds. were reported in 2/4 CBC's.

Isle of Pines - 1 spec., 27 Feb. 1913 (CM; Todd 1916). Read (1910b, 1911b&c, 1913c) included a 24 Oct. report and a comment that this species is a common winter resident. Todd (1916) wrote that it was apparently not common. Listed by G&GM (1975).

Seiurus noveboracensis - Northern Waterthrush.

41 specs.:

	day	year	mus.	nos.	ref.
Aug.	30	1930	USNM		
	?	1883	ANSP		

N=2

Sept.	1-6	1930	USNM	8	
	2,10	1919	USNM	2	
	22	1915	USNM		
	24	1913	USNM		
	24	1960	LSU		
	25,27	1955	PM	2	
N=15					
Oct.	2,8	1955	PM	2	
	18,20	1965	UF	2	
N=4					
Nov.	13	1901	USNM		
N=1					
Dec.	5	1925	PM		
	19	1908	USNM		
	30	1948	COR	3	
N=5					
Jan.	3	1949	COR	2	
	8	1927	USNM		
	22	1914	USNM		
N=4					
Feb.	12	1913	USNM		
N=1					
March	1	1915	MCZ		i
	3-22	1948	USNM	5	
	4,6	1930	USNM	3	g
N=9					

Garrido (1973) referred to at least 2 specs., undated, that I have not located. Bruner (1941) referred to 20 Aug. 1939 as an early fall date; this and a 8 July 1938 report were repeated by Davis (1941) and Bent (1953). Late dates have been 7 May 1938 (Davis 1941) and 20 May 1941 (Bruner 1941, Bent 1953). G&GM (1975) extended dates to 23 June and 28 May; there are less than four weeks out of the year between the departure of the last spring bird and the arrival of the first autumn bird. Numerous authors have noted that this species is common in mangroves (Barbour 1943, Bond 1950b, Eaton 1953, Garrido and Schwartz 1969, Garrido et al. 1986). Listed by Gundlach (1855a, 1861, 1872), Brewer (1860), Cory (1892), Ridgway (1902), Bruner (1939), and Garrido (1980). A total of 5 inds. were reported in 3 CBC's.

Isle of Pines - 6 specs.: 4 from 30 Sept.-16 Nov. 1912 (CM; Todd 1916) and 1 each from 13 March 1917 (MCZ) and 17 March 1902 (AMNH; Bangs and Zappey 1905). Read (1909a, 1910a&b, 1911a,b&c, 1913b&c) called this species common and included an early date of 20 Aug. and subsequent reports in Sept., Oct. and Nov. Todd (1916) noted a late spring sighting on 1 May 1913. Listed by Poey (1851), Cory (1892), Barbour (1943), and G&GM (1975).

Seiurus motacilla - Louisiana Waterthrush.

22 specs.:

	day	year	mus.	nos.	ref.
July	2	1959	LSU		j
	18	1960	LSU		
	20	1914	USNM		

N=3

Aug.	1	1914	USNM		
	1	1960	LSU		
	3,29	1913	USNM	2	
	24	1959	LSU		
	?	1883	ANSP	2	

N=7

Sept.	2	1904	MCZ		i
-------	---	------	-----	--	---

N=1

Oct.	28	?	USNM		
------	----	---	------	--	--

N=1

Jan.	1,2	1949	COR	4	
	5	1902	USNM		
	17	?	USNM		a

N=6

Feb.	16	1909	USNM		
	21	1907	BMNH		

N=2

March	1	1948	USNM		
-------	---	------	------	--	--

N=1

undated ? ? BMNH

N=1

Additional specs. (not located): 9 Oct. (Baird 1865) and 18 April 1935 (Bruner 1938-39). Davis (1941) noted 4 Oct. 1938 as an early date; Bruner (1938-39) saw birds as early as 14 Aug. 1938 and then on 13 Aug. 1939 (Bruner 1939, 1941). Bent (1953) listed extreme dates of 10 Aug. and 18 April. G&GM (1975) noted it along riverbanks and in other freshwater habitats from 14 July to 22 April. Eaton (1953) observed this bird Dec. 1948-Jan. 1949 along wooded freshwater streams, generally solitarily; this was the only warbler species studied that seemed to show strong territorial behavior. Barbour (1943) reported it from mountain streams. Observed by Chapman (1892), by Garrido and Schwartz (1968) in Jan. 1966 and by Berovides et al. (1982) between 11-15 April 1978. Listed by Gundlach (1857, 1861, 1872), Brewer (1860), Salvin and Godman (1881), Sharpe (1885), Cory (1892), and Ridgway (1902).

Isle of Pines - 1 spec., 7 Oct. 1925 (PM). Included in reports by Read (1909a, 1910a&b, 1911a,b&c, 1913c) are an early date of 24 Aug. 1909 and subsequent reports on 30 Sept., 20 Nov. 1909, and in Dec. Todd (1916) added that Read also reported the species on 21 Aug. 1911, 29 Aug. 1913, and as late as 4 April 1910. Todd added that, because Read's specimens were lost and Read was "admittedly not quite clear in discriminating" between this and noveboracensis, "it is deemed wise to delay the admission of

the present species to the list." Read (1924) conceded that he could have been mistaken in some of his identifications. Listed by G&GM (1975).

Oporornis formosus - Kentucky Warbler.

One spec., 15 Sept. 1960 (LSU; Schwartz and Klinikowski 1963). Additional specs. (not located): 1 found dead in Aug. and another collected in April (Gundlach 1872, Bruner 1938-39, Barbour 1943), 3 Aug. (Bond 1966), 2 on 10 April (Bond 1964), and 1 from April 1914 (Bruner 1938-39). Sighting, 4 April 1916 (Bruner 1938-39). Bond (1950a) and G&GM (1975) considered a rare transient; the latter gave 3 Aug., 15 Oct., and 19 Feb.-15 April as dates. Listed by Lembeys (1850), Gundlach (1855a, 1861), Brewer (1860), Salvin and Godman (1861), Sharpe (1885), Cory (1886, 1892), Ridgway (1902), and Hellmayr (1935).

Isle of Pines - Spec. reported (not located), 5 Oct. 1962 (Bond 1963). Listed by G&GM (1975).

Geothlypis trichas - Common Yellowthroat.

92 specs.:

	day	year	mus.	nos.	ref.
Sept.	8,21	1930	USNM	2	
	9	?	COR		
	26	1955	USNM		
	29	1911	USNM		

N=5

Oct.	6-9	1955	PM	4
	11-16	1913	USNM	4
	19	1918	USNM	
	28,29	1912	USNM	2

N=11

Nov.	1,18	1911	USNM	2
	20	1913	USNM	
	21	1925	AMNH	
	22	"	PM	
	29	1912	USNM	

N=6

Dec.	6	1925	PM	
	7	1911	USNM	
	12,30	1913	USNM	2
	14	1863	USNM	a
	15	1906	DNHM	
	19	"	AMNH	
	23	1901	USNM	
	23	1915	USNM	

N=9

Jan.	3	1949	COR	3
	13	1912	USNM	
	15	?	USNM	
	16	1861	AMNH	a
	21	1909	USNM	

N=7

Feb.	2-29	1948	USNM	4
------	------	------	------	---

8,16	1902	USNM	2
9,13	1949	USNM	2
10,11	1909	USNM	2
14,22	1900	USNM	2
19	1915	MCZ	
19,21	1907	BMNH	9

N=22

March	1	1930	USNM	
	6	1904	BMNH	
	7	1915	MCZ	
	8-29	1948	USNM	10
	13	1900	USNM	2
	18	1916	MCZ	
	20	1906	MCZ	
	20	1932	FM	2

N=19

April	5,7	1948	USNM	4
	7	1892	AMNH	
	8	1911	USNM	
	10	1907	BMNH	
	13,16	1900	USNM	2
	16	1904	MCZ	
	23	1915	MCZ	
	30	1930	USNM	

N=12

undated	?	?	MCZ	
---------	---	---	-----	--

N=1

Cory (1892b) collected spec(s?). (not located) in the winter of 1891-92. Extreme dates include 22 Sept.-11 May (Bruner 1941), 5 Sept.-12 May (Davis 1941, Bent 1953), and 3 Sept.-24 May (G&GM 1975). Bruner (1938-39) found a male singing on 12 June 1938. Barbour (1943) noted them "about marshes, in canebrakes and reed-beds, and in lowland thickets of vines and lianas." Garrido et al. (1986) observed them in open and brushy areas. Eaton (1953) saw them occasionally in loose single-species aggregations. Observed by Gundlach (1855a, 1872), Chapman (1892), Bruner (1943), Garrido and Schwartz (1968, 1969), Varona and Garrido (1970), Garrido (1973, 1980), and Berovides et al. (1982). Listed by Denny (1847), Brewer (1860), Gundlach (1861), Salvin and Godman (1881), Cory (1886), and Ridgway (1902). A total of 5 inds. has been reported in 2/4 CBC's.

Isle of Pines - 14 specs.:

	day	year	mus.	nos.	ref.
Oct.	26,29	1912	CM	2	f
	29	1955	PM		
N=3					
Nov.	21,22	1912	CM	2	f
N=2					
Dec.	3	1912	CM	2	f
N=2					
Jan.	10,15	1913	CM	2	f
N=2					
April	1	1948	USNM		

5,8 1913 CM 4 f

N=5

Among references by Read (1909a, 1910b&c, 1911a,b&c, 1913a,b&c) is an early report from Sept. and other early dates of 1 Oct. 1910 and 3 Oct. 1909 as well as reports in March and as late as 4 April 1910. Observed "almost daily" from 14-23 March 1945 (Walkinshaw and Baker 1946). Listed by Poey (1851), Cory (1892), Bangs and Zappey (1905), and G&GM (1975).

Teretistris fernandinae - Yellow-headed Warbler.

The genus Teretistris consists of two species that are both confined to this region. T. fernandinae occurs on the Isle of Pines and western Cuba and T. fornsi in eastern Cuba. Barbour (1943) wrote that "the two distinct species of Teretistris never have been observed to intergrade, and though the exact limits of their ranges are unknown" they are apparently entirely allopatric. Bond (1952) wrote "in spite of differences in color pattern in the two allopatrick [sic] forms of Teretistris may be conspecific."

82 specs.:

	day	year	mus.	nos.	ref.
July	?	1878	BMNH		
	"	"	FM		

N=2

Aug.	10	1958	UF		
------	----	------	----	--	--

	15,31	1955	PM	2
N=3				
Sept.	5	1959	LSU	
	11-19	1955	PM	4
	15-28	1960	LSU	11
	21	1930	USNM	4
N=20				
Oct.	28	1979	USNM	
N=1				
Nov.	1,12	1921	MCZ	3
N=3				
Jan.	2	1931	ANSP	
	5	1949	COR	
	8	1915	MCZ	2
N=4				
Feb.	17	1908	BMNH	3
	28	1917	MCZ	2
	?	1886	FM	3
	"	"	AMNH	
N=9				
March	1,2	1939	USNM	2
	5	1915	USNM	2
	7,8	1892	FM	2
	10-24	1900	USNM	3
	19-26	1948	USNM	3
	23	1923	ANSP	
N=13				

April	4-12	1900	USNM	4	
	"	"	MCZ		
	9	1941	UMMZ		
	11-19	1915	MCZ	4	
	25	?	USNM		a

N=11

May	5	1915	USNM		
	18	1900	MCZ		
	"	"	USNM		

N=3

June	2	1932	UMMZ		
	19	1960	LSU		
	22	1928	USNM		

N=3

undated	?	1916	USNM	2	
	?	?	BMNH	3	b
	?	?	USNM	2	a
	?	?	AMNH		
	?	?	FM		
	?	?	UF		

N=10

This species was described by Lembeye (1850) as Anabates fernandinae; Gundlach (1855a) chose the name Teretistris because Anabates was preoccupied. Additional specs. (not located): 19 and 20 Feb. (Baird 1865), and 1 or more from the winter of 1891-92 (Cory 1892b). This species also occurs on Cayo Cantiles, east of the Isle of Pines

(Bond 1952; Garrido and Schwartz 1969 collected 5 specs. there [not located]). Bond (1963, 1966) commented on the eastern extremes of its range. Barbour (1943) considered them "common in woodlands and about old, overgrown fields." G&GM (1975) noted them from woods and swamps. Huntington and Barbour (1936) noted a local extreme drop in population density in the days following the passage of a hurricane. Barbour (1943) wrote "they nest from late March to May, sometimes with a small, round nest placed on a horizontal branch, but more often in the pendant Spanish moss called 'guajaca'." Valdes Miro (1984) found and described 3 June and July nests each with either 2 or 3 eggs. Two males weighed a mean of 12.6 g and 2 females averaged 10.6 g (Ripley and Watson 1956). Two birds weighed by Olson (1985) were each 9 g. Observed by Gundlach (1872), Garrido and Schwartz (1968), and Garrido (1980). Listed by Brewer (1860), Gundlach (1861), Cory (1886, 1892), Ridgway (1902), Hellmayr (1935), Bond (1950a), Lowery and Monroe (1968), and the American Ornithologists' Union (1983).

Isle of Pines - 22 specs.:

	day	year	mus.	nos.	ref.
July	14,15	1958	UF	2	
	N=2				
Oct.	2-15	1925	PM	4	
	"	"	FM		
	N=5				
Nov.	13-20	1912	CM	6	f

	"	"	AMNH		f
N=7					
Jan.	20	1931	ANSP		
N=1					
March	19	1917	MCZ	2	
	?	1902	AMNH		
N=3					
May	3	1904	MCZ	2	e
	7	1913	CM		f
N=3					
June	4	1904	MCZ		e
N=1					

Included in references by Read (1911b&c, 1913c, 1924) is the comment that "it is the most common warbler that we have and is found always in flocks in the jungle." Bangs and Zappey (1905) noted that it inhabits thick, dense woods. Todd (196) noted that it kept to the densest cover in thick, damp woods. Listed by Poey (1851), Cory (1892), Ridgway (1902), Hellmayr (1935), Bond (1950a), Ripley and Watson (1956), Lowery and Monroe (1968), G&GM (1975), and the American Ornithologists' Union (1983).

Teretistris fornsi - Oriente Warbler.

121 specs.:

	day	year	mus.	nos.	ref.
July	16	1959	LSU	2	
	16-30	1960	LSU	5	k

	19	1917	USNM	2	
N=9					
Aug.	1	1861	USNM		
	1,18	1918	USNM	4	
	1-27	1960	LSU	10	k
	"	"	CM		k
	"	"	UMMZ		k
	3	1913	USNM		
	3	1959	LSU		
	3,7	1919	USNM	5	
	9,20	1917	AMNH	4	
	10	1958	UMMZ		
	14,29	1930	USNM	2	
	15	1919	USNM	5	
	24	1955	PM	3	
	?	1883	ANSP	2	
N=41					
Sept.	29	1917	USNM	2	
	30	1911	COR		
	"	"	USNM		
N=4					
Oct.	1,3	1911	USNM	2	
	19,24	1918	USNM	3	
	30	1903	USNM		
	?	1914	USNM		
N=7					

Nov.	4	1980	USNM	
N=1				
Dec.	8	1906	AMNH	
	15	1906	COR	
	18	1906	UF	2
	?	1915	ROM	
N=5				
Jan.	4	1914	USNM	
N=1				
Feb.	11-16	1907	BMNH	3
	16	1902	USNM	2
	"	"	MCZ	
	19	?	USNM	
	20	1911	USNM	
	23	1904	BMNH	2
	24	1930	USNM	g
	25	1915	MCZ	2
N=13				
March	2	1948	USNM	
	3	1914	USNM	2
	5	1916	ROM	
	"	"	USNM	
	8,9	1915	MCZ	4
	16,22	1892	FM	3
	?	1915	ROM	
	"	"	USNM	
N=14				

April	6-15	1904	AMNH	5	
	7,8	1969	LSU	4	
N=9					
May	5	1919	USNM	2	
	8,15	1912	USNM	3	
N=5					
June	21	1913	USNM		
N=1					
undated	?	1857	AMNH		
	?	1873	BMNH		
	?	?	USNM	5	a
	?	?	BMNH	2	b
	?	?	FM	2	

N=11

This species occurs only in eastern Cuba and on a few offshore cays. Additional specs. (not located): 4 Sept. 1861 (Baird 1865), 6 inds. from the western extreme of its range on 24 Feb. 1962 (Bond 1963), and 1 undated (Bond 1960). Gundlach (1858) described not only the species but its nest, which is built 1-3 m above the ground of small roots lined with hair, and its clutch size, which is 3. He noted that they are "constantly hopping upward from the lowest branches to the highest, on reaching which it flies to the bottom of another bush, and again hopping towards the top." Valdes Miro (1984) wrote that Gundlach's nest remained the only one that had been described. G&GM (1975) noted it from woods and reeds. Barbour (1943) wrote that it

is "similar in all respects, as to haunts and habits" to T. fernandinae. Olson (1985) reported that a female weighed 10 grams. Observed by Ripley and Watson (1956), Acosta and Berovides (1984), and Garrido et al. (1986). Listed by Brewer (1860), Albrecht (1861), Gundlach (1861, 1862, 1872), Cory (1886, 1892), Ridgway (1902), Hellmayr (1935), Bond (1950a), Lowery and Monroe (1968), and the American Ornithologists' Union (1983). Reported in each CBC (mean = 3.25 inds.).

Wilsonia citrina - Hooded Warbler.

2 specs.: 25 March 1900 (USNM) and 12 April 1947 (UMMZ). Additional specs. (not located): 3 Aug. (Bond 1966), 16 Sept. 1960 (Schwartz and Klinikowski 1963), 24 Sept. 1922 (Bruner 1938-39), ? Oct. 1914 (Bruner 1938-39), and 13 Jan. 1968 (Bond 1968). Gundlach (1855a, 1861, 1872) collected at least 3 specs. in April (1 each in a garden, mangroves, and on a stream bank) (Bruner 1938-39, Barbour 1943). Sightings: 23 Aug. 1944 (Bond 1962), 27 Aug. 1939 (Bruner 1939), and 15 Sept. 1937 (Bruner 1938-39). Observed by Berovides et al. (1982) in April 1978 and by Garrido (1980). Extreme fall dates in the literature are 27 Aug. 1939-24 Sept. 1922 (Bruner 1941, Bent 1953) and 3 Aug.-20 Oct. (G&GM 1975). Bruner (1941) knew only of 5-6 April spring dates; Bent (1953) included an earlier 25 March extreme. G&GM (1975) noted not only 16 March-18 April

extremes, but that some individuals spent the entire winter on Cuba.

Wilsonia pusilla - Wilson's Warbler.

Specs. reported (not located): 3 Oct. (Bond 1964) and 28 Oct. (G&GM 1975). Sightings: 18 Sept. (G&GM 1975), 24 Sept. and 12 Nov. (both in Bond 1950a, G&GM 1975), and Jan. 1988 (Norton 1988).

Wilsonia canadensis - Canada Warbler.

Specs. reported (not located): 22 Sept. (as in G&GM 1975, or 9 Oct. 1963 as in G&GM 1965), 24 Sept. 1972 (G&GM 1975), and 11 Oct. 1963 (Bond 1964, G&GM 1965).

Icteria virens - Yellow-breasted Chat.

Specs. reported (not located): 24 Oct. 1973 (Bond 1974, 1976, 1977, G&GM 1975) and 12 Feb. 1960 (Bond 1961, G&GM 1975). Sighting, 5 May (Bond 1976).

DISCUSSION

Four species of warblers breed on Cuba: Dendroica petechia gundlachi, Dendroica pityophila, Teretistris fernandinae, and Teretistris fornsi. The first two also occur in the Bahamas; the latter two are the only endemic species. At this point, splitting the two allopatric populations of Teretistris into two species is rather

arbitrary. Yellow Warblers and T. fernandinae also breed on the Isle of Pines.

Thirty-five species of migrants have been reported from Cuba. Thirteen of these are regular and relatively common winter residents: Dendroica discolor (130 specs. located), Geothlypis trichas (106), Dendroica palmarum (97), Dendroica dominica (82), Dendroica caerulescens (76), Dendroica tigrina (61), Parula americana (59), Seiurus noveboracensis (47), Seiurus aurocapillus (43), Setophaga ruticilla (41), Mniotilta varia (38), Dendroica coronata (23), and Seiurus motacilla (23). It appears that a few individuals of three other locally uncommon species overwinter: Dendroica magnolia, Dendroica virens, and Helmitheros vermivorus. Vermivora bachmanii is a special case in that the entire population of this extremely rare species has always wintered on Cuba (and perhaps the Isle of Pines). Several species, particularly Dendroica striata, appear regularly on Cuba on their way to or from a more southerly wintering range. Other species that winter primarily in southern Central or South America and seem to migrate through the mainland but occasionally appear on Cuba during migration, either accidentally or as on-course transients, include Vermivora chrysoptera, V. peregrina, Dendroica pensylvanica, D. fusca, D. castanea, D. cerulea, and Wilsonia canadensis. A few individuals of several species overwinter here and there in the West Indies - records on Cuba could be of transients or of occasional winter residents. Vermivora

pinus, Protonotaria citrea, Limnothlypis swainsonii, Oporornis formosus, and Wilsonia citrina fall into this category. Cuba is the only island in the West Indies outside of Trinidad and the southernmost Lesser Antilles where migrant Yellow Warblers (Dendroica petechia) have been regularly recorded. I do not know whether this is a real pattern or an artifact of variability in observer awareness. Individuals of Vermivora ruficapilla, Dendroica pinus, Wilsonia pusilla, and Icteria virens reported on Cuba are not in any sort of direct line of transit between any two places where they normally occur; they must be considered accidental. Vermivora ruficapilla is the only species on this list for which there is not at least one specimen reported in the literature.

LITERATURE CITED

- Acosta, M. and V. Berovides. 1984. Ornitocenosis de los cayos Coco y Romano, Archipelago de Sabana - Camaguey, Cuba. Poeyana 274:1-10.
- Albrecht, R. 1861. Zur Ornithologie Cuba's nach Geo. N. Lawrence und J. Gundlach mitgetheilt. J. f. Ornithologie 9:198-215.
- American Ornithologists' Union. 1983. Check-list of North American birds. 6th ed. American Ornithologists' Union, Washington, D.C. 877 p.
- Baird, S. F. 1865. Review of American birds in the Museum of the Smithsonian Institution. Part 1, North and Middle America. Smithsonian Misc. Coll. 181. 449 p.
- Bangs, O. and W. R. Zappey. 1905. Birds of the Isle of Pines. Amer. Nat. 39:179-215.
- Barbour, T. 1943. Cuban ornithology. Memoirs Nuttall Ornithol. Club 9:1-144.
- Bent, A. C. 1953. Life histories of North American wood warblers. Bull. U.S. Nat. Mus. 203:1-734.
- Berovides, A. V., H. Gonzales and M. E. Ibarra. 1982. Evaluacion ecologica de las comunidades de aves del area protegida de Najasa (Camaguey). Poeyana 239:1-14.
- Bond, J. 1930 The resident West Indian warblers of the genus Dendroica. Proc. Acad. Nat. Sci. Phila. 82:329-337.

- _____. 1942. Additional notes on West Indian birds. Proc. Acad. Nat. Sci. Phila. 94:89-106.
- _____. 1950a. Check-list of birds of the West Indies. 3rd ed. Wickersham Printing Co., Lancaster, Pa. 200 p.
- _____. 1950b. Results of the Catherwood-Caplin West Indies Expedition, 1948. Part 2: Birds of Cayo Largo (Cuba), San Andres and Providencia. Proc. Acad. Nat. Sci. Phila. 102:43-68.
- _____. 1951. First supplement to the check-list of birds of the West Indies. Acad. Nat. Sci. Phila. 22 p.
- _____. 1952. Second supplement to the check-list of birds of the West Indies (1950). Acad. Nat. Sci. Phila. 24 p.
- _____. 1956. First supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 8 p.
- _____. 1958. Third supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 11 p.
- _____. 1960. Fifth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 6 p.
- _____. 1961. Sixth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1962. Seventh supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 11 p.
- _____. 1963. Eighth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 11 p.
- _____. 1964. Ninth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 13 p.

- _____. 1965. Tenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 16 p.
- _____. 1966. Eleventh supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 13 p.
- _____. 1967. Twelfth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 22 p.
- _____. 1968. Thirteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1969. Fourteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 10 p.
- _____. 1974. Nineteenth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 12 p.
- _____. 1976. Twentieth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 14 p.
- _____. 1977. Twenty-first supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 16 p.
- _____. 1982. Twenty-fourth supplement to the check-list of birds of the West Indies (1956). Acad. Nat. Sci. Phila. 16 p.
- Bowdish, B. S. 1903. Birds of Porto Rico, part 2. Auk 20:10-23.

- Brewer, T. M. 1860. List of the birds of Cuba, compiled from two lists furnished by Dr. John Gundlach, of Havana. Proc. Boston Soc. Nat. Hist. 7:305-308.
- Bruner, S. C. 1938-39. Datos sobre migracion de aves en Cuba. Mem. Soc. Cubana Hist. Nat. "Poey" 12:167-179, 355-366, 13:21-30.
- _____. 1939. Aves del Bosque de la Havana. Mem. Soc. Cubana Hist. Nat. "Poey" 13:331-344.
- _____. 1941. Calendario de la migracion de las aves en Cuba occidental. Mem. Soc. Cubana Hist. Nat. 15:319-325.
- _____. 1943. Adiciones a las aves del Bosque de la Habana. Mem. Soc. Cubana Hist. Nat. 17:135-138.
- Cassin, J. 1860. Catalogue of birds collected during a survey of a route for a ship canal across the Isthmus of Darien, by order of the Government of the United States, made by Lieut. N. Michler, of the U.S. Topographical Engineers, with notes and descriptions of new species. Proc. Acad. Nat. Sci. Phila. 13:132-144, 188-197.
- Chapman, F. M. 1892. Notes on birds and mammals observed near Trinidad, Cuba, with remarks on the origin of West Indian bird-life. Bull. Amer. Mus. Nat. Hist. 4:279-330.
- Cooke, W. W. 1904. Distribution and migration of North American warblers. USDA Div. Biol. Surv. Bull. 18. U. S. Dept. Agric., Washington, D. C. 142 p.

- Cory, C. B. 1886. The birds of the West Indies, including the Bahama Islands, the Greater and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Part I. Auk 3:1-59.
- _____. 1892a. Catalogue of West Indian birds, containing a list of all species known to occur in the Bahama Islands, the Greater Antilles, the Caymans, and the Lesser Antilles, excepting the islands of Tobago and Trinidad. Published by the author, Boston. 163 p.
- _____. 1892b. In Cuba with Dr. Gundlach. Auk 9:271-273.
- Dathe, H. and W. Fischer. 1969. Bemerdenswerte Beobachtungen auf Kuba im Fruhjahr 1968. J. f. Ornithologie 110:111-112.
- Davis, D. E. 1941. Notes on Cuban birds. Wilson Bull. 53:37-40.
- Denny, W. 1847. A few remarks on the geographical distribution of birds in the West Indies. Proc. Zool. Soc. London 1847:36-41.
- Eaton, S. W. 1953. Wood warblers wintering in Cuba. Wilson Bull. 65:169-175.
- Garrido, O. H. 1971. La Bijirita del Pinar Dendroica pityophila (Gundlach). Poeyana ser A. 84:1-16.
- _____. 1973. Anfibios, reptiles y aves de Cayo Real (Cayos de San Felipe) Cuba. Poeyana 119:1-50.
- _____. 1980. Los vertebrados terrestres de la Peninsula de Zapata. Poeyana 203:1-49.

- _____. 1985. Cuban endangered birds. Ornithol. Monogr. 36:992-999.
- _____, A. R. Estrada and A. Llanes. 1986. Anfibios, reptiles y aves de Cayo Guajaba, Archipelago de Sabana - Camaguey, Cuba. Poeyana 328:1-34.
- _____ and F. Garcia Montana. 1965. Aves nuevas para Cuba. Poeyana 10:1-6.
- _____ and _____. 1975. Catalogo de las aves de Cuba. Academia de Ciencias de Cuba, Havana. 149 p.
- _____ and A. Schwartz. 1968. Anfibios, reptiles y aves de la peninsula de Guanahacabibes, Cuba. Poeyana ser A. 53:1-68.
- _____ and _____. 1969. Anfibios, reptiles y aves de Cayo Cantiles. Poeyana ser A. 67:1-44.
- Gochfeld, M. 1974. Status of the genus Vermivora (Aves, Parulidae) in the Greater Antilles with new records from Jamaica and Puerto Rico. Carib. J. Sci. 14:177-181.
- Gundlach, J. 1855a. Dr. J. Gundlach's Beitrage zur Ornithologie Cuba's. J. f. Ornithologie 3:465-480.
- _____. 1855b. Description of a new species of bird of the genus Sylvicola Swainson. Ann. Lyceum Nat. Hist. New York 6:160-161.
- _____. 1857. Dr. J. Gundlach's Beitrage zur Ornithologie Cuba's. J. f. Ornithologie 5:225-242.
- _____. 1861. Tabellarische Uebersicht aller bisher auf Cuba beobachteten Vogel. J. f. Ornithologie 9:321-349.

- _____. 1862. Zusatze und Berichtigungen zu den "Beitragen zur Ornithologie Cuba's." J. f. Ornithologie 10:177-191.
- _____. 1872. Neue Beitrage zur Ornithologie Cubas. J. f. Ornithologie 20:401-432.
- Hamel, P. 1986. Bachman's Warbler, a species in peril. Smithsonian Inst., Washington, D.C. 109 p.
- Hamilton, R. B. ms. Recent sight record of Bachman's Warbler at Tensas River National Wildlife Refuge, Louisiana.
- Hellmayr, C. E. 1935. Catalogue of birds of the Americas and adjacent islands. Field Museum Nat. Hist., Zool. Ser. 13, Part 8:1-541.
- Huntington, J. L. and T. Barbour. 1936. The birds at Soledad, Cuba, after a hurricane. Auk 53:436-437.
- Lawrence, G. N. 1862. Notes on some Cuban birds, with descriptions of new species. Ann. Lyceum Nat. Hist. New York 7:247-275.
- Lembeye, J. 1850. Aves de la isla de Cuba. Imprenta del Tiempo, Havana. 140 p.
- Lowery, G. H., Jr., and B. L. Monroe, Jr. 1968. Family Parulidae. P. 3-93 in R. A. Paynter, Jr., ed., Checklist of birds of the world, Vol. 14. Harvard Univ. Press, Cambridge, Mass.
- Meanley, B. 1971. Natural history of the Swainson's Warbler. North Amer. Fauna No. 69. Bureau of Sport

- Fish. & Wildl., U.S. Dept. Interior, Washington, D.C.
90 p.
- Moreno, A. 1940. Notas sobre ornitologia cubana. III.
Nuevo record. Mem. Soc. Cubana Hist. Nat. 14:409.
- Nolan, V., Jr. 1978. The ecology and behavior of the
Prairie Warbler Dendroica discolor. Ornithol. Monogr.
26:1-595.
- Norton, R. L. 1988. The winter season: West Indies region.
Amer. Birds 42:327-328.
- Olson, S. L. 1985. Weights of some Cuban birds. Bull.
Brit. Ornithol. Club 105:68-69.
- Peters, J. L. 1927. A revision of the Golden Warbler,
Dendroica petechia (Linne). Proc. Biol. Soc. Washington
40:31-41.
- Poey, F. 1851. Memorias sobre la historia natural de la
isla de Cuba. Imprenta de Barcina, Havana. 463 p.
- Ramsden, C. T. 1911. The Cuban Pine Warbler. Auk 28:268-
269.
- _____. 1914. Swainson's Warbler (Helinaia swainsoni) at
Guantanamo, Cuba. Auk 31:253.
- Read, A. C. 1909a. From the Isle of Pines. Oologist 26:57-
58.
- _____. 1909b. Additions. Oologist 26:224.
- _____. 1910a. A paddle down the Nuevas River, November 20,
1909. Oologist 27:5.
- _____. 1910b. From Isle of Pines. Oologist 27:14-15.

- _____. 1910c. From Isle of Pines, a field trip to "Sas Tres Hermanas" Mountains, April 4, 1910. Oologist 27:84.
- _____. 1911a. Migration notes from the Isle of Pines. Oologist 28:7.
- _____. 1911b. List of birds observed by A. C. Read on the Isle of Pines, Cuba, from December 1908, to December 1909. Oologist 28:11-13.
- _____. 1911c. Birds seen on one ten acre tract in West McKinley, Isle of Pines Cuba. Oologist 28:113-114.
- _____. 1913a. Impressions of the birds of McKinley, Isle of Pines, Cuba, made on an early spring morning (March 18, 1911). Oologist 30:122-123.
- _____. 1913b. Birds of the west coast section of Santa Barbara, during the month of September. Oologist 30:127-128.
- _____. 1913c. Birds observed on the Isle of Pines, Cuba, 1912. Oologist 30:130-131.
- _____. 1924. Anent some of my "doubtful" records. Oologist 41:134-135.
- Ridgway, R. 1902. The birds of North and Middle America. Part II. Bull. U.S. Nat. Mus. 50:1-834.
- Ripley, S. D. and A. Moreno. 1980. A recent sighting of Bachman's Warbler in Cuba. Birding 12:211-212.
- _____ and G. E. Watson, 3rd. 1956. Cuban bird notes. Postilla 26:1-6.

- Rodriguez, D. and M. E. Garcia. 1987. Ornitocenosis de una vegetacion litoral al norte de la Habana. Poeyana 347:1-7.
- Salvin, O. and F. D. Godman. 1881. Biologia Centrali-Americana. Aves. Vol. I. Taylor and Francis, London. 512 p.
- Schwartz, A. and R. F. Klinikowski. 1963. Observations on West Indian birds. Proc. Acad. Nat. Sci. Phila. 115:53-77.
- Sharpe, R. B. 1885. Catalogue of birds in the British Museum. Vol. 10. The British Museum, London. 682 p.
- Stevenson, H. M. 1972. The recent history of Bachman's Warbler. Wilson Bull. 84:344-347.
- Todd, W. E. C. 1916. The birds of the Isle of Pines. Ann. Carnegie Mus. 10:146-296.
- Valdes Miro, V. 1984. Datos de nidificacion sobre las aves que crian en Cuba. Poeyana 282:1-27.
- Varona, L. S. and O. H. Garrido. 1970. Vertebrados de los Cayos de San Felipe, Cuba, incluyendo una nueva especie de jutia. Poeyana ser. A. 75:1-26.
- Villalba, G. S. and S. C. Bruner. 1939. Nota sobre Dendroica aestiva en Cuba. Mem. Soc. Cubana Hist. Nat. "Poey" 13:329-330.
- Walkinshaw, L. H. and B. W. Baker. 1946. Notes on the birds of the Isle of Pines, Cuba. Wilson Bull. 58:133-142.

Wetmore, A. 1932. Birds collected in Cuba and Haiti by the
Parish-Smithsonian Expedition of 1930. Proc. U.S. Nat.
Mus. 81:1-40.

X. A DISTRIBUTIONAL ANALYSIS
OF THE WARBLERS OF THE WEST INDIES.

SUMMARY AND DISCUSSION

In the previous nine chapters, I presented the evidence for the occurrence of wood-warbler species found in the West Indies. In this final chapter, I summarize those data and attempt to evaluate how they apply to warbler conservation of residents and wintering or transient migrants. Resident warblers tend to use relatively undisturbed habitats whereas migrants tend to use human-disturbed habitats. A number of resident warbler populations are endangered, whereas most rare migrants are apparently threatened more by events on their breeding grounds than by events in the West Indies.

I present herein a summary of information for each of the 40 migrant species reported. Distinct patterns of occurrence are distinguished, although it is clear that there is variation within each pattern. A major finding of this study is that the temporal and spatial patterns of occurrence of virtually no two species are alike. Species pairs that are similar in geographic and temporal distribution often exhibit different patterns of habitat use. The apparent uniqueness of each species does not necessarily imply any sort of competitive exclusion, but it does mean that migrant warblers in the West Indies should not be treated as a homogeneous group with respect to distribution.

Because warbler species differ among each other in distribution the various regions of the West Indies vary in the composition of their migrant warbler avifaunas. I analyze the regional distribution later in this chapter.

PERMANENT RESIDENTS

Sixteen species of warblers breed in the West Indies. Grand Bahama and Abaco have the greatest number of species with five each followed by Cuba and Hispaniola with four apiece. The Cayos de Albuquerque, Sombrero, Saba, some of the Grenadines and perhaps Grenada, and some other small islands are the only islands that have no breeding warblers.

These 16 breeding species can be subdivided into four groups based on habitat use: 1) the 12 subspecies of Dendroica petechia that are inhabitants of mangrove habitat virtually throughout the West Indies; 2) inhabitants of pine forest: Dendroica dominica (Northern Bahamas), D. pityophila (Northern Bahamas and Cuba), and D. pinus (Northern and Central Bahamas and Hispaniola); 3) species that inhabit thickets or dry scrub vegetation, at times in the understory or in openings in forests. D. vitellina (Western Caribbean), D. adelaidae (Puerto Rico and St. Lucia and Barbuda in the Lesser Antilles), Geothlypis rostrata (Northern and Central Bahamas), and Microlihoa palustris vasta (Hispaniola) are truly scrubby thicket birds, whereas Teretistris fernandinae and T. fornsi (both Cuba) and

Microligea p. palustris and Xenoligea montana (both Hispaniola) are inhabitants of scrub often in the understory of various forest types; and 4) inhabitants of undisturbed, wet upland forest: D. pharetra (Jamaica), D. angelae (Puerto Rico), D. plumbea (Guadeloupe, Marie Galante, and Dominica in the Lesser Antilles), Catharopeza bishopi (St. Vincent in the Lesser Antilles), and Leucopeza semperi (St. Lucia).

There are nine populations of resident West Indian warblers that could be considered rare, threatened, or perhaps extinct including four subspecies of Yellow Warblers. Dendroica petechia armouri, confined to Isla de Providencia, is rare but its precise current status is unknown. D. p. ruficapilla is restricted to Martinique, where its numbers have been reduced to between 1000 and 2000 pairs by mongoose (Herpestes javanicus) predation, mangrove destruction, or Shiny Cowbird (Molothrus bonariensis) parasitism. The nominate subspecies, D. p. petechia, is or was found only on Barbados where 6-8 individuals were reported in 1984; the form may now be extinct. The current and historical status of D. p. alsiosa is imprecisely known. It occurs on the Grenadines and perhaps on Grenada. It may still be common on Prune Island but due to mangrove destruction and overgrazing only 8-10 individuals remained on Union Island in 1986. Its status on Mayero and Carriacou is unknown.

Dendroica plumbea plumbea may be threatened or extinct on Marie Galante but it is still common on Dominica. D.

angelae was recently described from the highlands of Puerto Rico. That it went unnoticed for so long suggests that it is extremely rare. However, fairly large numbers exist in a number of localities, and this species does not seem to be endangered.

Catharopeza bishopi is confined to St. Vincent. Its numbers were estimated to be about 1500 breeding birds in 1976. Disturbance of forested habitat to which this species is restricted could cause numerical reduction in the future. Leucopeza semperi is or was confined to St. Lucia. The most recent museum specimen was collected in 1934; the only sightings since then occurred in 1947, 1961, and 1972. This species may now be extinct.

Geothlypis rostrata rostrata is either extinct or very rare on New Providence but remains common on Andros.

TEMPORAL PATTERNS AMONG RESIDENT WARBLERS

The mean numbers of specimens of permanent residents per region (Table 1) varied significantly among months (ANOVA, $F = 4.42$, 21, 110 df, $P < 0.0001$) (Table 2). This pattern was examined to evaluate whether the variation was reasonable on biological grounds or whether there was evidence for monthly differences in collector effort. I assumed that collector effort would have been the same for residents as migrants. In general, permanent residents have been collected most in early spring, least in fall, and in intermediate numbers in summer. This pattern could be due to reproductive activity in those months in which larger numbers have been collected, particularly if singing males are conspicuous at those times. Increases in collection activity, thus, corresponded with presumed increases in conspicuousness (availability). Thus there was no strong evidence for monthly variation in collector activity. We can assume that the pattern for resident species is a result of a combination of effort and conspicuousness (availability). Presumably the pattern for migrants should be the same. Deviation of the migrant pattern from the resident pattern is thus treated as a difference in availability.

Table 1. The numbers of specimens of permanent resident warblers collected each month from each region of the West Indies.

	Month												
	J	A	S	O	N	D	J	F	M	A	M	J	T
NORTHERN BAHAMAS													
<u>D.pet.</u>	5								6	7		2	20
<u>D.domin.</u>	1	6	1					3		10	5	1	27
<u>D.pityo.</u>	3	5	2		5		5	16	1	25	1	5	68
<u>D.pinus</u>	7				2		1	2		18	6	15	51
<u>G.rost.</u>	10	9			8	3	5	18	6	20	6	13	98
CENTRAL BAHAMAS													
<u>D.pet.</u>					3		3	8	7	4	8	4	37
<u>D.pinus</u>	14	7			4	4	14	3	8	10	7	2	73
<u>G.rost.</u>	7				8	7	11	23	22	26	15	7	126
SOUTHERN BAHAMAS													
<u>D.pet.</u>	50	49	28	2	1	5	22	18	14	11	32	39	271

Table 1 (cont.)

	Month												
	J	A	S	O	N	D	J	F	M	A	M	J	T
CUBA													
<u>D.pet.</u>	7	21	74	8	3	8	2	7	27	21	19	9	206
<u>D.pityo.</u>		1	8					11	25	6	6	11	68
<u>T.fernand.</u>	4	3	20	6	10		5	9	16	11	6	4	94
<u>T.fornsi</u>	9	41	4	7	1	5	1	13	14	9	5	1	110
WESTERN CARIBBEAN													
<u>D.pet.</u>	16	36	18		3		8	7	44	58	15	2	207
<u>D.vitel</u>	40	31	9	2	24		19	28	61	41	8	6	269
JAMAICA													
<u>D.pet.</u>	4	6	1	4	14	2	3	19	14	2	2	4	75
<u>D.phar</u>	2	4		10	1	3		2	3	9	8	2	43
HISPANIOLA													
<u>D.pet.</u>	16	1	10	1	8			14	20	20	1	15	106
<u>D.pinus</u>	12	13	7	1	1	2		4	4	7	15	3	69
<u>M.palus.</u>	4	24	2	7			24	12	12	10	21	3	119
<u>X.montan.</u>	3	1		1			17	12	9	11	5	5	64

Table 1 (cont.)

	Month												
	J	A	S	O	N	D	J	F	M	A	M	J	T
PUERTO RICO													
<u>D.pet.</u>	9	27	6	8	19	7	12	20	37	59	10	5	219
<u>D.adel.</u>	3	13	1	6	17	7	8	15	17	21	23	1	132
<u>D.angel.</u>	5				7				1				13
VIRGIN ISLANDS													
<u>D.pet.</u>	6	13	4		4	44	12	24	14		2	1	124
NORTHERN LESSER ANTILLES													
<u>D.pet.</u>	22	22	31	2	5	10	15	63	59	25	14	12	280
<u>D.adel.</u>		11	1		9	5	8	2	2		1		39
<u>D.plum.</u>	4	11	5	1			11	17	8			18	75
SOUTHERN LESSER ANTILLES													
<u>D.pet.</u>	8	25	9	13	16	25	64	48	15	23	11	12	269
<u>D.adel.</u>	1	2	2		3	9	14	4	22	5	2	5	69
<u>D.plum.</u>	6	12	1	1	1	3	11	29	22	9	5		99
<u>C.bish.</u>			2		4	3		8	9	3	1		30
<u>L.semp.</u>						2		4	1	2	1	5	15

Table 2. Waller-Duncan K-ratio T test for mean numbers of specimens of resident warblers by month in the West Indies. Means with the same letter are not significantly different from each other.

Waller Grouping	Mean	Month
<hr/>		
A	47.27	March
A	43.91	April
A B	42.09	February
A B C	35.82	August
B C D	26.82	January
C D	25.27	July
C D	23.73	May
C D E	22.36	September
D E	19.27	June
D E	16.46	November
D E	14.00	December
E	7.27	October

Table 3. Waller-Duncan K-ratio T test for mean numbers of specimens of each of the 13 common migrant warbler species by month in the West Indies. Means with the same letter are not significantly different from one another.

Waller Grouping	Mean	Month
A	67.54	March
A	61.46	February
A	57.92	January
B	37.92	November
B	34.62	April
B	34.38	December
B	32.69	October
C	16.62	September
C D	9.92	August
C D	5.08	May
D	1.08	July
D	0.00	June

SUMMATION OF TEMPORAL DISTRIBUTION OF MIGRANT WARBLERS

As would be expected, the mean number of specimens of each species of the 13 most common migrant warbler species in the West Indies (Tables 31-43) differed significantly among months (ANOVA, $F = 15.52$, 23, 132 df, $P < 0.0001$). January, February, and March were the months in which specimens have been collected most frequently (Table 3). The total number of specimens from these three months was significantly greater than that from October, November, December, and April. Migrant warblers were significantly fewer in August, September, and May; this grouping overlaps to some extent with June and July. January through March is the peak of the winter season. Fall migration is much more protracted than spring migration. August and September is early and October through December is the peak of fall migration. In contrast, the spring migration period is short with a peak in April and a precipitous drop in numbers in May.

The temporal distribution patterns of migrants and residents are similar to each other (Figure 1). The lack of migrants in summer months is not due to a lack of collecting, nor is the increase in fall due to an increase in effort. The low numbers in December are somewhat anomalous, but seem to be associated with reduced effort.

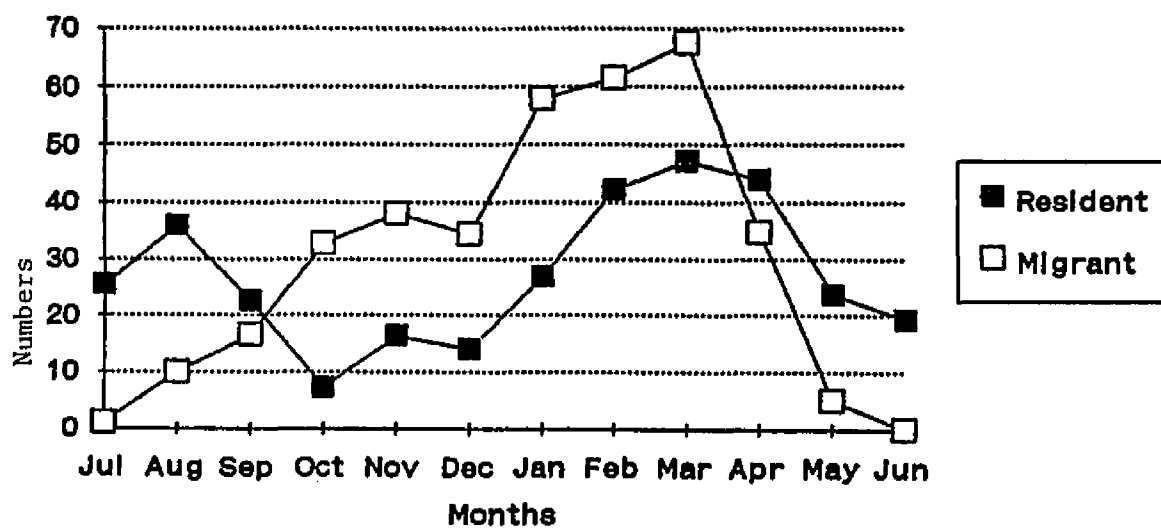


Figure 1. Temporal distribution of warblers in the West Indies.

GEOGRAPHIC AND TEMPORAL DISTRIBUTION OF MIGRANT SPECIES

In the 40 tables that summarize the evidence for the occurrence of migrants in each month in each region,¹ Columns represent months and rows contain data by region. The rows for Bermuda, Cuba, the Western Caribbean, Jamaica, Hispaniola, Puerto Rico, and the Virgin Islands include information from all islands treated in their respective chapters. The Bahamas have been subdivided into the Northern Bahamas (islands of the Little Bahamas Bank, including Grand Bahama and Abaco), the Central Bahamas (all islands on the Great Bahama Bank and some outlying groups), and the Southern Bahamas (from the Crooked Island group through the Turks and Caicos). The Northern Lesser Antilles includes Marie Galante and Guadeloupe and all islands to the north; the Southern Lesser Antilles includes Dominica and all islands to the south. Within the body of each table, numerals represent the number of museum specimens that I have located.

At the base of each table are the total number of specimens of migrants from the West Indies as well as the overall number of specimens that I have located from all regions south of the United States (the West Indies plus Middle and South America). These totals are followed by their ranking among the 38 species that constitute the West Indian migrant warbler avifauna. Below that is the percentage of all specimens from each of the four major

regions south of the United States. A "p" indicates that the species has been reported but that there are either no specimens or that the percentage of total specimens is less than 0.5%. Some of the totals in some of the tables are less than the totals in the nine regional summaries because undated specimens listed in the earlier chapters have been omitted here.

Forty species of migrant warblers have been reported from the West Indies. These can be segregated into nine fairly distinct groups.

I. STRICTLY ACCIDENTAL SPECIES

Pine and Townsend's Warblers are strictly accidental as migrants and will not be included in subsequent discussions of the West Indian migrant warbler avifauna.

There are four subspecies of Pine Warblers: 1) Dendroica pinus chrysoleuca, a sedentary permanent resident of pine habitat in the uplands of Hispaniola, 2) D. p. achrustera, a sedentary permanent resident of the pine flats of several of the Bahamas, and 3&4) D. p. pinus and D. p. florida, breeding and wintering residents of the southeastern United States. The latter two subspecies are not strictly sedentary, but the entire populations are essentially confined to the United States. Stragglers reach the West Indies (Table 4) and northeastern Mexico very infrequently. Reports from the 19th Century of large

numbers of Pine Warblers on Bermuda in October were probably of Blackpoll Warblers. A specimen and a few apparently legitimate sight reports document the occasional occurrence of D. p. pinus on Bermuda. Measurements of specimens reported from Cuba suggest that they are also of D. p. pinus. However, identity of the specimen reported from Cay Sal in the southern Bahamas has not been confirmed and Jamaican reports are questionable.

Townsend's Warblers (Dendroica townsendi) (Table 5) breed in western North America and winter in Mexico and Central America. They have occasionally been reported on Bermuda and the northern Bahamas; another has been photographed in the southern Bahamas. I consider these occurrences as accidental and the Townsend's Warbler, like the Pine Warbler, is not considered a significant component of the migrant avifauna of the West Indies.

Table 4. Evidence for the occurrence of the Pine Warbler (*Dendroica pinus*) in the West Indies (migrants only; West Indian breeding populations are sedentary).¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM					1	r						
NBAH												
CBAH											nl	
SBAH												
CUBA				nl	nl							
WCAR												
JAM				r						r		
(hypo)												
HISP												
PRICO												
(hypo)												
VIR I												
NLANT												
SLANT												
TOTAL	0	0	0	0	1	0	0	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 1												
TOTAL NUMBER OF SPECIMENS LOCATED - 4 (not included among the 38 West Indian migrant species; members of the nominate subspecies winter in the United States)												
% OF ALL SPECS. FROM	MEXICO		CENTRAL AMERICA		SOUTH AMERICA		WEST INDIES					
	p ²		0		0		p ²					

¹See Table 6 for key to symbols.

²p is used here to indicate that numbers south of the United States are extremely small relative to numbers within the country.

Table 5. Evidence for the occurrence of Townsend's Warbler
(*Dendroica townsendi*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			l	r		r						
NBAH										r		
CBAH												
SBAH							e					
CUBA												
WCAR												
JAM												
HISP												
PRICO (hypo)												
VIR I												
NLANT												
SLANT												
TOTAL	0	0	1	0	0	0	0	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 1												
TOTAL NUMBER OF SPECIMENS LOCATED - 548 (strictly accidental; not included among 38 West Indian species)												
% OF ALL SPECS. FROM	MEXICO		CENTRAL AMERICA		SOUTH AMERICA		WEST INDIES					
	73		27		0		p					

¹See Table 6 for key to symbols.

II. ACCIDENTAL BUT NOT UTTERLY UNUSUAL SPECIES

The remaining 38 species constitute the regular West Indian migrant warbler avifauna. There are five species have been occasionally recorded in the West Indies but which winter almost exclusively on the mainland. Three of the five, Vermivora celata (Table 6), V. ruficapilla (Table 7), and Icteria virens (Table 8), have been noted sporadically in the Bahamas but never south or east of the Greater Antilles. Reports of a fourth, Wilsonia pusilla (Table 9), are more scattered and as with most reports of irregularly occurring migrants, the bulk have been during the fall. The fifth species in this group, Dendroica petechia (Table 10), exhibits an unusual pattern. Although one of 12 subspecies of Yellow Warbler is resident on almost every island in the West Indies, most specimens and reports of Yellow Warblers that breed on the mainland come from those few islands devoid of resident populations (i.e., Bermuda and the southernmost Lesser Antilles). There could be an interaction with breeding residents that excludes migrants. This seems highly unlikely because, at the very least, of habitat differences. Although their degree of habitat restriction varies from island to island, West Indian breeding birds in general are mangrove specialists. In contrast, temperate-breeding wintering migrants on the mainland prefer dry, upland, disturbed habitats. On the larger islands at least, if migrants were present, then they

should not come into contact with residents. A second possibility is that a Yellow Warbler of any type is readily recognized as an unusual bird on an island like Bermuda and is duly noted. On islands on which resident subspecies are common, any migrants that appear, even in habitats atypical for residents, might be assumed to be a resident and thus not worthy of collection or note. Migrants are readily separable from residents in the hand and even with reasonably careful observation in the field. Adult males are distinctive, but female and juvenile migrants and residents appear quite similar to each other. If migrants were really common anywhere, there would surely have been a few of them among the 1814 residents collected. Migrant Yellow Warblers may be more common in the West Indies than the record indicates. Nevertheless, the wintering ranges of the various migratory subspecies that are common breeding birds from Alaska to central Mexico are largely separate from the ranges of the permanent resident West Indian subspecies.

Table 6. Evidence for the occurrence of the Orange-crowned Warbler (*Vermivora celata*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM				1	r	r						
NBAH				r	r							
CBAH			r	r	e		1				r?	
SBAH												
CUBA												
WCAR												
JAM												
(hypo)												
HISP												
PRICO												
VIR I												
NLANT												
SLANT												
TOTAL	0	0	0	1	0	0	1	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 2 (31/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 805 (10/38; many winter in the U.S.)												
% OF ALL SPECS. FROM	MEXICO		CENTRAL AMERICA		SOUTH AMERICA		WEST INDIES					
	99		p		0		p					

¹n - specimens in literature but not located;
e - published evidence (i.e., netting, photograph);
r - published sight report; h - hypothetical;
p - present, but no specimens or <0.5% of total;
fractions are rankings among the 38 species.

Table 7. Evidence for the occurrence of the Nashville Warbler (*Vermivora ruficapilla*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			nl	2	r							
NBAH				r				e	e			
CBAH				nl	r	r			r			
SBAH			r						r	r		
CUBA				nl								
WCAR												
JAM										r		
HISP			r									
PRICO												
VIR I												
NLANT												
SLANT												
TOTAL	0	0	0	2	0	0	0	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 2 (31/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 628 (15/38)												
% OF ALL SPECS. FROM	MEXICO				CENTRAL AMERICA			SOUTH AMERICA		WEST INDIES		
	95				5			0		p		

¹See Table 6 for key to symbols.

Table 8. Evidence for the occurrence of the Yellow-breasted Chat (*Icteria virens*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM				r	l							
NBAH		r	e		e				e			
CBAH			e	e	r							
SBAH												
CUBA				nl				nl			r	
WCAR								r				
JAM												
HISP												
PRICO												
VIR I												
NLANT												
SLANT												
TOTAL	0	0	0	0	1	0	0	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 1 (35/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 798 (11/38)												
% OF ALL SPECS. FROM	MEXICO				CENTRAL AMERICA			SOUTH AMERICA		WEST INDIES		
	84				16			0		p		

¹See Table 6 for key to symbols.

Table 9. Evidence for the occurrence of Wilson's Warbler
(*Wilsonia pusilla*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r			r						
NBAH				r	e					r		
CBAH			nl						r			
SBAH												
CUBA			r	nl	r		r					
WCAR												
JAM			r			r						
HISP					r							
PRICO							e					
VIR I												
NLANT												
SLANT												
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 0												
TOTAL NUMBER OF SPECIMENS LOCATED - 1892 (1/38)												
% OF ALL SPECS. FROM	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	77				23			0			p	

¹See Table 6 for key to symbols.

Table 10. Evidence for the occurrence of the Yellow Warbler (*Dendroica petechia*) in the West Indies (migrants only; West Indian breeding populations are sedentary).¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM		2	2	1	nl	r						
NBAH												
CBAH		r	r	r	r							
SBAH												
CUBA		nl	r	nl				nl		1	r	
WCAR										r		
JAM												
HISP												
PRICO												
VIR I												
NLANT												
SLANT			1	r	3				r			
TOTAL	0	2	3	1	3	0	0	0	0	1	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 10 (23/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 1626 (2/38)												
% OF ALL SPECS. FROM	MEXICO			CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES		
	42			33			23			1		

¹See Table 6 for key to symbols.

III. SOUTH AND CENTRAL AMERICAN WINTERING, NOT PRIMARILY WEST INDIAN TRANSIENTS.

There are seven species that winter in South America or southern Central America that appear in the West Indies during periods of migration.

Individual birds listed in this and the previous section are not necessarily "lost." Within a species, demes or individuals could do something quite different from the majority of individuals and survive. That, of course, is the basis behind any sort of range expansion. Nonetheless, the birds in this and the last section are unusual in the West Indies. There are 105 reports of one type or another in all regions combined from August, September, and October. This is during the fall migration period, and thus most of these birds are assumed to have been migrating. Many of the 39 reports in November and December could also have been of migrating birds. There are 17 reports from mid-winter (January and February) and 63 from months in which spring migration is generally occurring (March, April, and May). Roughly speaking, there are about twice as many reports from fall than from spring.

There are several possible explanations for the preponderance of fall records. Four of the five months with least apparent availability (collecting effort and conspicuousness) of permanent residents are September, October, November, and December (Table 2). Conversely,

March and April are the months with the most apparent effort. Thus the preponderance of fall reports of unusual migrants is not an artifact of increased effort.

Fall migration follows reproduction and more individuals are alive during fall than in spring. Many fall migrants are juveniles making their first migratory flight. If a disproportionate number of unusual fall West Indian birds are juveniles, it is probable that they were lost or outside the normal migratory pathway. If the ratio of adult to juvenile fall migration records is the same as in the population at large, then it is probable that West Indian reports are a sub-sample of the migrants that use uncharacteristic migratory routes or wintering grounds. Reduced numbers in spring would be due to overwintering mortality. Unfortunately, the ratio of immature to adults among fall records is not known. Collectors in the past frequently failed to report the age of birds, and I have not analyzed the small amount of available information. Continued modern-day collecting with rigorous standards of data collection would provide relevant data to help clarify distributional patterns.

Grouping of migrant warblers is useful for description but acts to obscure differences among species. For example, other than one March specimen, all reports of Oporornis philadelphia (Table 11) are from the fall and are probably of off-course birds. Wilsonia canadensis (Table 12) migrates primarily through Mexico on its way to South

America (D.N.P., unpublished data) and is also largely accidental in the West Indies. Vermivora peregrina (Table 13) also is common in Mexico during migration (D.N.P., unpublished data); West Indian records are frequent and its occurrence there is probably the result of regular migratory routes. The other four species, Dendroica pensylvanica (Table 14), D. fusca (Table 15), D. castanea (Table 16), and D. cerulea (Table 17) are not common in either Mexico or the West Indies. These could be the quintessential "trans-Gulf" migrants. The spatial and temporal pattern of the first two species (Tables 14 and 15) looks like a "U"; this suggests that some individuals that arrive in the eastern and southern West Indies spend their winters there. D. cerulea is an early migrant not known from the eastern Greater nor the Lesser Antilles.

Table 11. Evidence for the occurrence of the Mourning
Warbler (*Oporornis philadelphia*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			1	1								
NBAH												
CBAH			r		r							
SBAH			r									
CUBA												
WCAR												
JAM												
HISP				1	nl							
PRICO				r		r			1			
VIR I												
NLANT												
SLANT												
TOTAL	0	0	1	2	0	0	0	0	1	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 4 (27/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 423 (23/38)												
% OF ALL SPECS. FROM	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	25				47			28			p	

¹See Table 6 for key to symbols.

Table 12. Evidence for the occurrence of the Canada Warbler
(*Wilsonia canadensis*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r									
NBAH (e, undated)												
CBAH			nl	r								
SBAH												
CUBA			nl	nl								
WCAR												
JAM			r					r				
HISP												
PRICO				r		r?			r			
VIR I							nl			r		
NLANT (hypo)												
SLANT												
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 0												
TOTAL NUMBER OF SPECIMENS LOCATED - 587 (18/38)												
% OF ALL SPECS. FROM	MEXICO		CENTRAL AMERICA		SOUTH AMERICA		WEST INDIES					
	40		17		43		p					

¹See Table 6 for key to symbols.

Table 13. Evidence for the occurrence of the Tennessee Warbler (*Vermivora peregrina*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			2	1			1		r	r		
NBAH				e	r	r						
CBAH			r	r	r			r		r		
SBAH				1	r					r		
CUBA			nl	nl	r	nl			r	r	r	
WCAR						r			nl	3		
JAM					r	r		r	r			
HISP				r								
PRICO												
VIR I									e			
NLANT												
SLANT											r	
TOTAL	0	0	2	2	0	0	1	0	0	3	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 8 (24/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 819 (9/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES	
	19				60				19		1	

¹See Table 6 for key to symbols.

Table 14. Evidence for the occurrence of the Chestnut-sided Warbler (*Dendroica pensylvanica*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r	1					r			
NBAH				r								
CBAH			r	r	r						r	
SBAH				1							r	
CUBA			1	nl						r	nl	
WCAR										r		
JAM				nl		nl						
HISP										r		
PRICO				r	r		r			r		
VIR I				r	r	r	r		r	r		
NLANT					r							
SLANT									r			
TOTAL	0	0	1	2	0	0	0	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 3 (28/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 370 (26/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	12				87			0			1	

¹See Table 6 for key to symbols.

Table 15. Evidence for the occurrence of the Blackburnian Warbler (Dendroica fusca) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			1	r					r			
NBAH				e	r	r						
CBAH		r	r	2						r		
SBAH				r						r	r	
CUBA		r	r	nl	r	nl				r	nl	
WCAR										1	r	
JAM											r	
HISP				1					r	r		
PRICO							r?	r?	r			
VIR I						r			r			
NLANT												
SLANT				1								
TOTAL	0	0	1	4	0	0	0	0	0	1	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 6 (25/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 631 (14/38)												
% OF ALL SPECS. FROM												
MEXICO				CENTRAL AMERICA				SOUTH AMERICA			WEST INDIES	
6				30				63			1	

¹See Table 6 for key to symbols.

Table 16. Evidence for the occurrence of the Bay-breasted Warbler (*Dendroica castanea*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r	1								
NBAH				r								
CBAH				r	nl							
SBAH												
CUBA			r	r	nl					r	r	
WCAR			r	r		r				nl	r	
JAM					r						r	
HISP				r								
PRICO				nl				r?				
VIR I				1							1	
NLANT					r?							
SLANT				r								
TOTAL	0	0	0	2	0	0	0	0	0	0	1	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 3 (28/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 269 (30/38)												
% OF ALL SPECS. FROM	MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES	
	8				55				35		3	

¹See Table 6 for key to symbols.

Table 17. Evidence for the occurrence of the Cerulean Warbler (*Dendroica cerulea*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM		r	r	1								
NBAH												
CBAH			e	r						r		
SBAH												
CUBA		nl	r	r						nl		
WCAR		1				r			nl	r		
JAM												
HISP												
PRICO												
VIR I												
NLANT												
SLANT												
TOTAL	0	1	0	1	0	0	0	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 2 (31/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 106 (33/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	5				36			56			4	

¹See Table 6 for key to symbols.

IV. SOUTH AMERICAN WINTERING, STRICTLY WEST INDIAN TRANSIENTS

Two species breed in northern North America, winter exclusively in South America, and migrate almost entirely through the West Indies. The route of southward migration of the Blackpoll Warbler (Dendroica striata) is discussed at length in the chapter on Bermuda (Chapter 5). Virtually all individuals of this species fly south from the New England coast over the central Atlantic (and Bermuda) to the eastern West Indies (normally no farther west than Hispaniola), and then down through the Lesser Antilles to South America (Table 18). This migration occurs from late September to early November. Northward migration takes place in April and May and occurs farther to the west. No uncontestable spring records of Blackpoll Warblers exist from anywhere east or south of Hispaniola. Because this species is easily misidentified in the field and because of its rigid patterns of migration, any reports from the West Indies outside of these two brief periods of time should be thoroughly documented.

The migratory route of the Connecticut Warbler (Oporornis agilis) (Table 19) is poorly known, but seems to be limited to the West Indies. Fall specimens and reports are fairly numerous; they are centered in October and come from a variety of locales (the single Central American specimen was collected in Panama in October). Two specimens

and a report from the Bahamas are the only data for this species in the spring. Again, any reports from outside of migratory periods must be thoroughly documented.

Table 18. Evidence for the occurrence of the Blackpoll Warbler (Dendroica striata) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			1	5	r							
NBAH				1						r	r	
CBAH			r	42	1					4	4	
SBAH			4	r	r					5	11	
CUBA			r	1	nl					2	1	nl
WCAR		1	1							3	r	
JAM								r?	e			
HISP			1	15	1	r?					5	
PRICO			r	15	5							
VIR I				4	r							
NLANT			r	4								r?
SLANT				11		1						
TOTAL	0	1	7	98	7	1	0	0	0	14	21	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 149 (13/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 426 (22/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	1				.0			64			35	

¹See Table 6 for key to symbols.

Table 19. Evidence for the occurrence of the Connecticut Warbler (*Oporornis agilis*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r	5								
NBAH												
CBAH			r	2	r						2	
SBAH				1				r?			r	
CUBA												
WCAR												
JAM												
HISP				2	nl							
PRICO			r	nl		r?						
VIR I										r?		
NLANT				nl								
SLANT												
TOTAL	0	0	0	10	0	0	0	0	0	0	2	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 12 (20/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 24 (37/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES	
	0				4				46		50	

¹See Table 6 for key to symbols.

V. MAINLAND WINTERING SPECIES THAT ARE UNCOMMON BUT REGULAR
IN THE WEST INDIES

Seven species of typically mainland-wintering birds also occur regularly in small numbers during winter in the West Indies.

Vermivora chrysoptera (Table 20) marginally falls into this category; it may have been better placed along with Central and South American wintering birds that are unusual transients in the West Indies. The northern records are of fall and spring migrants, but mid-winter reports from the Greater Antilles suggest that a few individuals overwinter.

The temporal and spatial distribution patterns for Protonotaria citrea (Table 21) and Oporornis formosus (Table 22) are U-shaped and migration through northern islands and some overwintering on more southerly islands is apparent.

The patterns shown by Vermivora pinus (Table 23), Dendroica magnolia (Table 24), D. virens (Table 25), and Wilsonia citrina (Table 26) are similar to each other. In each case, from 2-4% of the examined specimens come from the West Indies. W. citrina arrives and leaves earlier than the others and D. virens seems to linger later. V. pinus, a relatively rare bird with a large wintering range, does not appear to be common anywhere.

Table 20. Evidence for the occurrence of the Golden-winged Warbler (*Vermivora chrysoptera*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r	r							r	
NBAH									r			
CBAH			r	r								
SBAH				r								
CUBA			r	nl		r				nl	r	
WCAR												
JAM						r						
HISP							nl	r				
PRICO						r		r				
VIR I						r						
NLANT												
SLANT												
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 0												
TOTAL NUMBER OF SPECIMENS LOCATED - 157 (32/38)												
% OF ALL SPECS. FROM	MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES	
	7				58				34		p	

¹See Table 6 for key to symbols.

Table 21. Evidence for the occurrence of the Prothonotary Warbler (Protonotaria citrea) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM		1	r	r	nl							
NBAH			r		e					1		
CBAH		2	r	r						r		
SBAH		r	r	1								
CUBA		r	nl	r			nl	r	r	nl		
WCAR		1		r		r			1	r		
JAM			r				r	r				
HISP				nl						r		
PRICO		r		r	r	r	e					
VIR I				1		r	r		r			
NLANT						r	r			r		
SLANT				1	1		1	r				
TOTAL	0	4	0	3	1	0	1	0	1	1	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 11 (21/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 305 (29/38)												
% OF ALL SPECS. FROM	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	10				48			37			5	

¹See Table 6 for key to symbols.

Table 22. Evidence for the occurrence of the Kentucky Warbler (*Oporornis formosus*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			1									
NBAH		r	e	r								
CBAH		r	r	r						r		
SBAH		r	r			r				r		
CUBA		nl	1	nl				r		nl		
WCAR					r	r				e		
JAM (1,undated)												
HISP (1,undated)				r		r						
PRICO				r		r						
VIR I				r		r	r	r	r			
NLANT					r	r		r				
SLANT												
TOTAL	0	0	2	0	0	0	0	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 2 (31/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 558 (19/38)												
% OF ALL SPECS. FROM	MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES	
	62				35				3		p	

¹See Table 6 for key to symbols.

Table 23. Evidence for the occurrence of the Blue-winged Warbler (*Vermivora pinus*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r	r								
NBAH					r					nl	e	
CBAH			r	e	l	r	l	r	r			
SBAH				r			r		r	e		
CUBA		nl	r	nl	r	nl			r	nl		
WCAR						r						
JAM				e			r	r				
HISP			r				r			l		
PRICO (hypo)												
VIR I				r	r	r			r			
NLANT												
SLANT												
TOTAL	0	0	0	0	1	0	1	0	0	1	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 3 (28/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 90 (34/38)												
% OF ALL SPECS. FROM	MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES	
	59				37				2		2	

¹See Table 6 for key to symbols.

Table 24. Evidence for the occurrence of the Magnolia Warbler (Dendroica magnolia) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			1	r	r	r	r	r	r	r	nl	
NBAH				r	r		r	e		r		
CBAH			r	5	2	r	r		r	r	r	
SBAH			1	r		1	e	1	e	e		
CUBA			r		nl	r	r		1	1	nl	
WCAR				r	r	r				1	r	
JAM					r			nl				
HISP				2		1		1	2			
PRICO			r	1	r	nl			r	r		
VIR I						r		r	r			
NLANT				r		r						
SLANT										1		
TOTAL	0	0	2	8	2	2	0	2	3	3	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 22 (17/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 599 (17/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES	
	56				41				0		3	

¹See Table 6 for key to symbols.

Table 25. Evidence for the occurrence of the Black-throated Green Warbler (*Dendroica virens*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			1	r	r	r		r			nl	
NBAH					r			e				
CBAH			r	1	r	r	r	1		r	r	
SBAH				1	r			r		r		1
CUBA			r	1	r	1	nl	r	r	r	r	
WCAR				r	r	r				r		
JAM								1				
HISP				2		r				1		
PRICO				r		r		r		1		
VIR I			1	nl				r	r	1	1	
NLANT					1	r	1		r			
SLANT (1,undated)										r		
TOTAL	0	0	2	5	1	1	1	2	0	3	1	1
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 17 (18/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 634 (13/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	52				45			0			3	

¹See Table 6 for key to symbols.

Table 26. Evidence for the occurrence of the Hooded Warbler
(*Wilsonia citrina*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM		1	2	r	r	r			nl	r		
NBAH					r					1		
CBAH			r	nl	r	r		r	nl	nl		
SBAH				1	r		1		r	r		
CUBA		nl	nl	nl			nl		1	1		
WCAR									1	e		
JAM (1, undated)												
HISP				r	1		r			e		
PRICO				r	1	r	e	e				
VIR I						r		r	2	1		
NLANT				r	r		r		1			
SLANT					1			1				
TOTAL	0	1	2	0	3	0	1	1	5	3	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 16 (19/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 328 (27/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES	
	63				33				p		4	

¹See Table 6 for key to symbols.

VI. UNCOMMON SPECIES FOR WHICH THE WEST INDIES CONSTITUTE
AN IMPORTANT COMPONENT OF WINTER RANGE

Helmitheros vermivorus (Table 27) and Limnothlypis swainsonii (Table 28) are uncommon species (ranked number 31 and 35 respectively in abundance out of the 38) whose extensive winter ranges include the West Indies. Small numbers of Worm-eating Warblers winter in the Bahamas and Greater Antilles but most overwinter on Cuba and Jamaica. Swainson's Warbler is a rare bird that seems to be regular on Jamaica and unpredictable north and west of that island. The Virgin Island reports are far from its normal range. The high percentage of specimens collected in Mexico is in part a result of a fairly large number from periods of migration in an area where the species does not typically overwinter in southern Veracruz and in part a result of a large number from throughout winter from Isla Cozumel, which is more West Indian than Mexican in its zoogeography. It is possible that the West Indies are considerably more important for this species than specimen data indicate.

Table 27. Evidence for the occurrence of the Worm-eating Warbler (*Helmitheros vermivorus*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r	nl	r	r						
NBAH							1	e	1	2	r	
CBAH	r	r	r		1	nl	1		e	2	r	
SBAH			1	1				1	r	r		
CUBA		r	1		4	r	1	2		r	r	
WCAR				r	1	r	r	2	nl	3		
JAM			r	1	1	2	2	2	1	r		
HISP			nl		1		r					
PRICO				r					r			
VIR I				1		r		r	r	2		
NLANT				r	r							
SLANT												
TOTAL	0	0	2	3	8	2	5	7	2	9	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 38 (16/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 230 (31/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	48				35			p			17	

¹See Table 6 for key to symbols.

Table 28. Evidence for the occurrence of Swainson's Warbler
(Limnothlypis swainsonii) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM				r	r			1				
NBAH			e				e	e	e	e		
CBAH			e			r		r	3	1	r	
SBAH												
CUBA			nl				nl			nl		
WCAR						r			1			
JAM				1	1	nl	1	nl	1	1		
HISP												
PRICO												
VIR I								r	r			
NLANT												
SLANT												
TOTAL	0	0	0	1	1	0	1	1	5	2	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 11 (21/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 64 (35/38)												
% OF ALL SPECS. FROM	MEXICO					CENTRAL AMERICA			SOUTH AMERICA		WEST INDIES	
	77					11			0		12	

¹See Table 6 for key to symbols.

VII. RARE SPECIES THAT WINTER ONLY IN THE WEST INDIES

Bachman's Warbler (Vermivora bachmanii) (Table 29) and Kirtland's Warbler (Dendroica kirtlandii) (Table 30) are special cases in that they are extremely rare species that winter exclusively in the West Indies. A complete discussion of the wintering biology of Bachman's Warbler can be found in the chapter on Cuba. Kirtland's Warbler is treated in its entirety (save for a single questionable report from Hispaniola and a sight report from Mexico) in the Bahama Island chapter.

Table 29. Evidence for the occurrence of Bachman's Warbler
(*Vermivora bachmanii*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM												
NBAH												
CBAH									nl			
SBAH												
CUBA			3		1	1	1	nl	r			
WCAR												
JAM												
HISP												
PRICO												
VIR I												
NLANT												
SLANT												
TOTAL	0	0	3	0	1	1	1	0	0	0	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 6 (25/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 6 (38/38)												
% OF ALL SPECS. FROM	MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES	
	0				0				0		100	

¹See Table 6 for key to symbols.

Table 30. Evidence for the occurrence of Kirtland's Warbler
(*Dendroica kirtlandii*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM												
NBAH		r		1	r	r		r	2	e		
CBAH		r			5	2	2	7	15	9	1	
SBAH							1	r	r			
CUBA												
WCAR												
JAM												
HISP (hypo)												
PRICO												
VIR I												
NLANT												
SLANT												
TOTAL	0	0	0	1	5	2	3	7	17	9	1	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 45 (15/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 46 (36/38)												
% OF ALL SPECS. FROM	MEXICO		CENTRAL		SOUTH		WEST					
			AMERICA		AMERICA		INDIES					
	0		0		0		100					

¹See Table 6 for key to symbols.

VIII. COMMON WEST INDIAN SPECIES THAT ARE WIDESPREAD IN THE
NEOTROPICS

The bulk of the remainder of the discussion and analysis will focus on the 13 species in this and the next category. Dendroica coronata (Table 31), Mniotilta varia (Table 32), Setophaga ruticilla (Table 33), Seiurus aurocapillus (Table 34), Seiurus noveboracensis (Table 35), Seiurus motacilla (Table 36), and Geothlypis trichas (Table 37) are common in winter not only in the West Indies but also in various parts of the mainland.

Table 31. Evidence for the occurrence of the Yellow-rumped Warbler (*Dendroica coronata*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM				1	2	1	nl	r	r	nl		
NBAH						1			8	1		
CBAH			r	r	2	4	2	2	10	r		r
SBAH				1	e		18	5	1	r		
CUBA			r	r	6	5	5	3	2	1	r	
WCAR					r	r	11	6	10	r		
JAM				nl	r	3	6	2	r	2		
HISP				nl	2	7	32	34	13	2		
PRICO					2	r	4	6	15	1		
VIR I					r	2	1	r	r			
NLANT (r, undated)												
SLANT											1	
TOTAL	0	0	0	2	14	23	79	58	59	7	1	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 243 (12/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 1411 (4/38; many [most?] winter in the United States))												
% OF ALL SPECS. FROM	MEXICO		CENTRAL AMERICA		SOUTH AMERICA		WEST INDIES					
	74		12		p		14					

¹See Table 6 for key to symbols.

Table 32. Evidence for the occurrence of the Black-and-white Warbler (*Mniotilta varia*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM		r	1	2	r	2	nl	r	1	1	nl	
NBAH				r	2				1	2	r	
CBAH	r	r	r	6	3	1	2		11	4	r	
SBAH		r	3	r		e	1		e	2	r	
CUBA	r	8	6	4	1	6	1	7	2	2	r	
WCAR		4	1		r	r		3	7	e	r	
JAM			r	2	1	4	6	7	6	3	r	
HISP			3	5	1	1	15	11	14	4	1	
PRICO	r		r	10	9	2	3	2	7	7		
VIR I			r	2		1	1	3	2	1		
NLANT			r	2	5	1	3	6	5	1		
SLANT				r	1		r			3		
TOTAL	0	12	14	33	23	18	32	39	56	30	1	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 258 (11/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 1052 (8/38)												
% OF ALL SPECS. FROM				MEXICO		CENTRAL		SOUTH		WEST		
						AMERICA		AMERICA		INDIES		
				41		24		13		22		

¹See Table 6 for key to symbols.

Table 33. Evidence for the occurrence of the American
Redstart (Setophaga ruticilla) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM	1	r	r	2	r	r	r	r	r	r		
NBAH				2		r	1			r	r	
CBAH	r	r			1		1		5	10	6	r
SBAH			1	r	e	e	1			3	5	
CUBA	r	2	4	6	3	5	2	5	10	1	3	r
WCAR		nl		1	r	r		4	1	5	r	
JAM		3	3	1	9	4	11	6	2	1	r	
HISP	1	3	2	17	3	10	27	19	29	10	6	
PRICO			r	3	3	6	6	4	10	6	r	
VIR I		1	2		1	4	4	6	nl	1	r	
NLANT		1	4	5	9	8	11	17	17	r		
SLANT			1	5	13		6	6	5	3		
TOTAL	2	10	17	42	42	37	70	67	79	40	20	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 426 (5/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 1341 (5/38)												
% OF ALL SPECS. FROM	MEXICO					CENTRAL AMERICA			SOUTH AMERICA		WEST INDIES	
	21					18			26		33	

¹See Table 6 for key to symbols.

Table 34. Evidence for the occurrence of the Ovenbird
(*Seiurus aurocapillus*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r	1	3	2	r	r	r	r		
NBAH		r		r		3	2		1	4	r	
CBAH		r	r	12	17	3	2	3	10	9	1	
SBAH			1	r		e	8		2	1	11	
CUBA		r	7	5	1	2	8	8	10	2		
WCAR				1	1	r		2	3	1	r	
JAM			r	7	9	3	4	7	5	1		
HISP			4	12	4	2	22	29	19	21	r	
PRICO			r	10	8	3	3	3	7	10		
VIR I			1			1	2			r		
NLANT				8	2	1	2	2	1			
SLANT				1								nl
TOTAL	0	0	13	57	45	20	53	54	58	49	12	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 361 (7/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 1060 (7/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES	
	49				19				p		31	

¹See Table 6 for key to symbols.

Table 35. Evidence for the occurrence of the Northern Waterthrush (Seiurus noveboracensis) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM		2	2	r	1	1	r	nl	r	r		
NBAH		r		r		r	1		2	1	r	
CBAH		r		1	4	r	4	2	2	2	2	
SBAH		r	1			1	1	1		1	3	
CUBA	r	2	16	6	2	5	4	1	11	r	r	r
WCAR		3	1		1	r		2	3	3	7	
JAM		1	1	2	4	3	2	4	2			
HISP		1	3	8	3	1	2	12	4	2	1	
PRICO		r	3	9	13	2	6	7	3	8		
VIR I		r	4			6	3	1	3	3	r	
NLANT		2	6	8	6	4	1	6		2		
SLANT	r		1	3	7	3	2	2	6	1	1	
TOTAL	0	11	38	37	41	26	26	38	36	23	14	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 290 (10/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 1169 (6/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	26				27			31			25	

¹See Table 6 for key to symbols.

Table 36. Evidence for the occurrence of the Louisiana Waterthrush (Seiurus motacilla) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM		1	nl			nl	nl					
NBAH										nl		
CBAH	1	r	nl		r	r			2	1		
SBAH	r			r								
CUBA	3	7	1	2	r	r	6	2	1	nl		
WCAR	1	2				r			2			
JAM			3	2	2	3	2					
HISP	1	7			1	r	4	5	2	1		
PRICO		nl	r	r	nl	2	7	2	r	r		
VIR I	r	1	1		1	1		4	r	r		
NLANT			2				3			1		
SLANT								1	r			
TOTAL	6	18	7	4	4	6	22	14	7	3	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 91 (14/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 399 (25/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA		WEST INDIES		
	58				20			1		21		

¹See Table 6 for key to symbols.

Table 37. Evidence for the occurrence of the Common
Yellowthroat (*Geothlypis trichas*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			nl	1	r	r	r	r	r	r		
NBAH				r	2		11	10	11	8		
CBAH			r	3	21	7	14	14	42	29	3	r
SBAH			r	1		r					2	
CUBA			5	14	8	11	9	22	19	17	r	
WCAR					r	r		3	1	2	r	
JAM		r	r	1	5	19	36	18	4	4		
HISP			3	6	nl	1	9	18	35	10	1	
PRICO				r		r	3	3	4	2		
VIR I						r	r		r	1		
NLANT					r				r			
SLANT							r					
TOTAL	0	0	8	26	36	38	82	88	116	73	6	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 473 (3/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 1624 (3/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	57				12			p			31	

¹See Table 6 for key to symbols.

IX. SPECIES THAT ARE COMMON AND ARE LARGELY RESTRICTED TO
THE WEST INDIES IN WINTER

The majority of all specimens that I have located of Parula americana (78%, Table 38), Dendroica tigrina (97%, Table 39), Dendroica caerulescens (96%, Table 40), Dendroica dominica (68%, Table 41), Dendroica discolor (97%, Table 42), and Dendroica palmarum (88%, Table 43) are from the West Indies. These and the previous seven species are the common and characteristic components of the West Indian migrant warbler avifauna and will be discussed in detail in much of the remainder of this chapter.

Table 38. Evidence for the occurrence of the Northern
Parula (Parula americana) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r	1	r	r	r	r	nl	1		
NBAH						3	8			1		
CBAH		r		7	9	3	1	1	4	7	r	
SBAH			1	1		e		2	2	3	2	
CUBA	r	3	8	10	7	11	2	8	9	3	r	
WCAR					1	r	1	5	3	5		
JAM		r	r	4	9	14	17	16	5	2		
HISP				9	4	9	26	13	17	4		
PRICO		r	r	2	28	9	20	13	25	30	2	r
VIR I			r		6	7	7	6	3	r	r	
NLANT			r		2	1	6	10	8	2		
SLANT					r	1	1	2		1		
TOTAL	0	3	9	34	66	58	89	76	76	59	4	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 474 (2/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 608 (16/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	18				4			0			78	

¹See Table 6 for key to symbols.

Table 39. Evidence for the occurrence of the Cape May Warbler (*Dendroica tigrina*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r	r	r	1	r	r	1	nl		
NBAH				r		2	r	1	nl	5	r	
CBAH		r	r	10	15	3	8	3	10	21	1	
SBAH			3		1	4	11	17	6	5	r	
CUBA			1	8	9	13	6	9	10	5	r	
WCAR		r			e	r	r	r	3	11		
JAM				4	3	5	10	5	9	2		
HISP		r		13	3	15	33	60	30	15		
PRICO			r	r	14	r	2	16	2	1		
VIR I			r			1	1	r	2	5		
NLANT				r	r	nl		2		r		
SLANT							3	r	nl			
TOTAL	0	0	4	35	45	44	74	113	73	70	1	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 459 (4/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 473 (20/38)												
% OF ALL SPECS. FROM												
MEXICO				CENTRAL AMERICA				SOUTH AMERICA		WEST INDIES		
2				1				0		97		

¹See Table 6 for key to symbols.

Table 40. Evidence for the occurrence of the Black-throated Blue Warbler (Dendroica caerulescens) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			r	1			1					
NBAH				r				1		1		
CBAH			r	1	nl	r	1		1	5	3	
SBAH			r	1	e	1	e		r	4	1	
CUBA			10	8	11	8	3	14	22	nl	r	
WCAR					r	r		2		e	r	
JAM	r			3	2	12	3	3	2	3	r	r
HISP				12	7	7	42	28	28	7	1	
PRICO			r	1	9	3	2	7	6	8		
VIR I				1		r		1	1	r		
NLANT				r	r	r						
SLANT							r					
TOTAL	0	0	10	28	29	31	52	56	60	28	5	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 299 (9/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 311 (28/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	3				p			p			96	

¹See Table 6 for key to symbols.

Table 41. Evidence for the occurrence of the Yellow-throated Warbler (Dendroica dominica) in the West Indies (migrants only; West Indian breeding populations are sedentary).¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM		r	1	1	r	r	r	r	r	r		
NBAH						3	1					
CBAH	r	4	nl	9	7	3	9	1	8	1		
SBAH		1		2		1	2	4	1			
CUBA	2	17	18	8	2	6	4	8	17			
WCAR	r	6	5		r	r	1	3	1			
JAM		r	3	3	5	18	33	15				
HISP		13	8	3	5	6	7	24	2	r		
PRICO		r	1	1	1	2	r	1				
VIR I					r	r	r					
NLANT					r			1				
SLANT												
TOTAL	2	41	36	27	20	39	57	57	29	1	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 309 (8/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 454 (21/38)												
% OF ALL SPECS. FROM												
	MEXICO				CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES	
	18				14			0			68	

¹See Table 6 for key to symbols.

Table 42. Evidence for the occurrence of the Prairie Warbler (Dendroica discolor) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			1	nl	r	r						
NBAH						2	5	2	3	4		
CBAH	nl	4	e	29	19	6	3	10	47	12		
SBAH		5	15			e	7	7	5	r		
CUBA	4	20	27	8	11	16	2	13	21	7	r	
WCAR		2	5		1			1	7	2		
JAM		1	3	4	13	9	14	10	7	r		
HISP		r	4	12		8	9	21	44	2		
PRICO		1	2	11	14	4	12	11	18	3		
VIR I			1	1	3	14	5	5	1	1		
NLANT		1		2	4	r	1	9	3			
SLANT (1,undated)						r				r		
TOTAL	4	34	58	67	65	59	58	89	156	31	0	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 621 (1/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 640 (12/38)												
% OF ALL SPECS. FROM	MEXICO					CENTRAL AMERICA			SOUTH AMERICA		WEST INDIES	
	2					1			0		97	

¹See Table 6 for key to symbols.

Table 43. Evidence for the occurrence of the Palm Warbler
(*Dendroica palmarum*) in the West Indies.¹

	Month											
	J	A	S	O	N	D	J	F	M	A	M	J
BERM			nl	nl	1	1	1	r	r	r		
NBAH				1	1	7	15	3		5		
CBAH		r	r	6	34	7	7	1	18	21	1	
SBAH			r	r		r	2	7	nl	e	1	r
CUBA			2	16	14	18	10	21	14	1	r	
WCAR					r	r	1	6	10	r		
JAM			r		2	3	9	3	1	1		
HISP				5	4	7	13	6	26	6		
PRICO			r	5	7	4	1	3	3	2		
VIR I				r	r	1	r	r	1	r		
NLANT												
SLANT												
TOTAL	0	0	2	33	63	48	59	50	73	36	2	0
TOTAL NUMBER OF WEST INDIAN SPECIMENS - 366 (6/38)												
TOTAL NUMBER OF SPECIMENS LOCATED - 416 (24/38)												
% OF ALL SPECS. FROM	MEXICO			CENTRAL AMERICA			SOUTH AMERICA			WEST INDIES		
	9			4			0			88		

¹See Table 6 for key to symbols.

DISTRIBUTIONAL PATTERNS OF THE COMMON MIGRANT WARBLERS

If migrant birds were distributed randomly over the entire West Indies the proportion of birds occupying any region would correspond to the proportion of the total land area of that region (Table 44). The birds of Cuba and Hispaniola are underrepresented and the birds of the other areas are overrepresented (Chi-square = 13,576, $df = 10$, $P < 0.0005$). However, I have been unable to visit Cuba and acquire data on specimens there. I do not know the number of specimens of these 13 species in Cuban museums. There would have to be about 1500 additional Cuban specimens in order to bring the ratio in Table 44 close to 1.0; I find this extremely unlikely because this is almost twice as many Cuban specimens as I found in all other museum collections combined.

Even with the bias discussed above, there is an association of island size with the number of specimens as determined by a Spearman's rank correlation coefficient ($r_s = .804$, $P < 0.005$).

Table 44. The numbers and percentages of total number of specimens of the 13 common wintering West Indian warblers and the areas¹ and percentages of total area from each region of the West Indies. The ratio is the percentage of specimens over the percentage of area.

Region	No.Specs. %		Area(km sq) %		Ratio
Hispaniola	1144	24.5	80,660	34.2	0.72
Cuba	822	17.6	117,000	49.5	0.36
Central Bahamas	655	14.0	5,680	2.4	5.83
Jamaica	536	11.5	9,200	3.9	2.95
Puerto Rico	529	11.3	11,400	4.8	2.35
N.Lesser Antilles	204	4.4	2,634	1.1	4.00
Southern Bahamas	200	4.3	2,200	0.9	4.78
Western Caribbean	174	3.7	250	0.1	37.00
Northern Bahamas	149	3.2	3100	1.3	2.46
Virgin Islands	139	3.0	417	0.2	15.00
S.Lesser Antilles	79	1.7	3643	1.5	1.13
Bermuda	40	0.9	52	0	
TOTAL	4671		236,236		

¹ From Lack (1976)

Are the ratios in Table 44 indicative of differences in the density of migrant warblers? It may be that the first specimen of a particular species from a small island like Montserrat may be of considerably more interest to a collector than the 50th specimen of that species from Hispaniola. The Montserrat specimen, however, if preferentially collected, would inflate the Northern Lesser Antilles percentage of all specimens. Small islands may be overcollected relative to area and large islands undercollected.

Variation in topographic and thus habitat variety were noted among islands. The islands least represented per area by specimens, Cuba and Hispaniola, are topographically and climatologically diverse. Some of the over-represented regions such as the Bahamas and Western Caribbean are relatively flat and biologically monotonous. This data set, therefore, does not suggest that a higher density of migrant warblers inhabit islands with greater topographic diversity.

If each warbler species were distributed randomly over terrestrial habitat in the West Indies, the percentage of specimens of each species from each region would be the same as the percentage of the total number of specimens of all species for that region. A series of Chi-square tests the null hypothesis that the distribution of a given species is not the same as the distribution of all species combined. The null hypothesis cannot be rejected for any one of the 13 common species (Table 45). The species with distributions

closest to being typical of the group as a whole are the Black-and-white Warbler, Ovenbird, and Louisiana Waterthrush (note, however, that the latter species is the least common of the 13 in the region and that several expected values are less than 5.0; in this case Chi-square results are not reliable). The hypothesis that all of the common West Indian migrant warblers have essentially the same ranges can be rejected.

Table 45. Numbers of specimens of each common migrant warbler from each region, the percentage of specimens of that species from that region, and the rank in abundance (r) among these 13 species in each region. Chi-square values are described in the text¹.

Parula americana

	#	%	r
NBah	12	2.6	4
CBah	32	7.0	7
SBah	11	2.4	5
Cuba	61	13.3	6
WCar	15	3.3	6
Jam	67	14.6	3
Hisp	82	17.8	8
PRico	127	27.6	1
VI	29	6.3	2
NLant	29	6.3	3
SLant	5	1.1	3

Chi-square 85.67**

Dendroica tigrina

	#	%	r
NBah	8	2.2	7
CBah	71	19.1	4
SBah	47	12.7	1
Cuba	61	16.4	6
WCar	14	3.8	8
Jam	38	10.2	6
Hisp	83	22.4	7
PRico	35	9.4	8
VI	9	2.4	6
NLant	2	0.5	8
SLant	3	0.8	5

Chi-square 163.20**

Table 45 (cont.)

<u>Dendroica caerulescens</u>				<u>Dendroica coronata</u>			
	#	%	r		#	%	r
NBah	2	0.7	12	NBah	10	4.2	5
CBah	4	1.4	12	CBah	20	8.4	10
SBah	7	2.4	10	SBah	25	10.5	3
Cuba	76	26.2	5	Cuba	22	9.2	12
WCar	2	0.7	13	WCar	27	11.3	1
Jam	28	9.7	9	Jam	13	5.5	12
Hisp	132	45.5	2	Hisp	90	37.8	6
PRico	36	12.4	7	PRico	28	11.8	9
VI	3	1.0	9	VI	3	1.3	9
NLant	0	0	-	NLant	0	0	-
SLant	0	0	-	SLant	0	0	-
Chi-square 135.61**				Chi-square 116.35**			

<u>Dendroica dominica</u>				<u>Dendroica discolor</u>			
	#	%	r		#	%	r
NBah	4	1.3	9	NBah	16	2.6	3
CBah	42	13.7	6	CBah	130	21.0	2
SBah	11	3.6	5	SBah	39	6.3	2
Cuba	82	26.7	4	Cuba	129	20.8	1
WCar	16	5.2	5	WCar	18	2.9	3

Table 45 (cont.)

Jam	77	25.1	2	Jam	61	9.8	4
Hisp	68	22.1	9	Hisp	100	16.1	5
PRico	6	2.0	13	PRico	76	12.3	2
VI	0	0	-	VI	31	5.0	1
NLAnt	1	0.3	9	NLAnt	20	3.2	5
SLAnt	0	0	-	SLAnt	0	0	-
Chi-square 165.13**				Chi-square 73.01**			

Dendroica palmarum

	#	%	r
NBah	32	8.8	2
CBah	95	26.2	3
SBah	10	2.8	7
Cuba	96	26.4	3
WCar	17	4.7	4
Jam	19	5.2	10
Hisp	67	18.5	10
PRico	25	6.9	10
VI	2	0.6	11
NLAnt	0	-	-
SLAnt	0	-	-
Chi-square 146.90**			

Mniotilta varia

	#	%	r
NBah	6	2.4	8
CBah	27	10.7	8
SBah	6	2.4	11
Cuba	37	14.7	11
WCar	15	6.0	6
Jam	29	11.5	8
Hisp	55	21.8	11
PRico	40	15.9	5
VI	10	4.0	5
NLAnt	23	9.1	4
SLAnt	4	1.6	4
Chi-square 28.40*			

Table 45 (cont.)

Setophaga ruticilla

	#	%	r
NBah	3	0.7	11
CBah	23	5.4	9
SBah	10	2.4	7
Cuba	41	9.7	10
WCar	11	2.6	9
Jam	40	9.5	5
Hisp	127	30.0	3
PRico	38	9.0	6
VI	19	4.5	4
NLAnt	72	17.0	1
SLAnt	39	9.2	1

Chi-square 356.10**

Seiurus aurocapillus

	#	%	r
NBah	10	2.8	5
CBah	57	16.1	5
SBah	23	6.5	4
Cuba	43	12.1	9
WCar	8	2.3	10
Jam	36	10.1	7
Hisp	113	31.8	4
PRico	44	12.4	4
VI	4	1.1	8
NLAnt	16	4.5	6
SLAnt	1	0.3	6

Chi-square 30.19*

Seiurus noveboracensis

	#	%	r
NBah	4	1.4	9
CBah	17	6.0	11
SBah	8	2.8	9
Cuba	47	16.5	8
WCar	20	7.0	2

Seiurus motacilla

	#	%	r
NBah	0	0	-
CBah	4	4.4	12
SBah	0	0	-
Cuba	22	24.4	12
WCar	5	5.6	12

Table 45 (cont.)

Jam	19	6.7	10	Jam	12	13.3	13
Hisp	37	13.0	12	Hisp	21	23.3	13
PRico	51	18.0	3	PRico	11	12.2	12
VI	20	7.0	3	VI	8	8.9	7
NLant	35	12.3	2	NLant	6	6.7	7
SLant	26	9.2	2	SLant	1	1.1	6
Chi-square 207.97**				Chi-square 27.80*			

Geothlypis trichas

	#	%	r
NBah	42	8.7	1
CBah	133	27.6	1
SBah	3	0.6	12
Cuba	105	21.8	2
WCar	6	1.2	11
Jam	97	20.1	1
Hisp	83	17.2	7
PRico	12	2.5	11
VI	1	0.2	12
NLant	0	0	-
SLant	0	0	-
Chi-square 254.05**			

¹ df = 10, * - P < .005, ** -, P < .0005

REGIONAL COMPARISONS

When the five most common migrant warbler species in each of the eleven West Indian regions (not including Bermuda) are listed, some regions share common species (Table 46). To compare distributions among regions, I computed the frequency of each of the 13 common migrants within each region and used a metric distance formula (Rogers 1972) to compute the distance between each pair of regions. A matrix of distance values was generated and relationships summarized in the form of a tree based upon the arithmetic averages of unweighted pair group (UPGMA, Sneath and Sokal 1973) (Figure 2).

Table 46. Numbers of specimens of the most common species
from each West Indian region.

BERMUDA		NORTHERN BAHAMAS	
Black-&-white	7	C.Yellowthroat	42
N.Waterthrush	6	Palm	32
Ovenbird	6	Prairie	16
Yellow-rumped	4	Ovenbird	10
		Yellow-rumped	10
CENTRAL BAHAMAS		SOUTHERN BAHAMAS	
C.Yellowthroat	133	Cape May	47
Prairie	130	Prairie	39
Palm	95	Yellow-rumped	25
Cape May	71	Ovenbird	23
Ovenbird	57		
CUBA		WESTERN CARIBBEAN	
Prairie	129	Yellow-rumped	27
C.Yellowthroat	105	N.Waterthrush	20
Palm	96	Prairie	18
Yellow-throated	82	Palm	17
Black-thr.Blue	76	Yellow-throated	16

Table 46 (cont.)

JAMAICA		HISPANIOLA	
C.Yellowthroat	97	Cape May	169
Yellow-throated	77	Black-thr.Blue	132
N.Parula	67	Am.Redstart	127
Prairie	61	Ovenbird	113
Am.Redstart	40	Prairie	100
PUERTO RICO		VIRGIN ISLANDS	
N.Parula	127	Prairie	31
Prairie	76	N.Parula	29
N.Waterthrush	51	N.Waterthrush	20
Ovenbird	44	Am.Redstart	19
Am.Redstart	44		
NORTHERN LESSER ANTILLES		SOUTHERN LESSER ANTILLES	
Am.Redstart	72	Am.Redstart	39
N.Waterthrush	35	N.Waterthrush	26
N.Parula	29	N.Parula	5
Black-&-white	23	Black-&-white	4
Prairie	20	Prairie	3

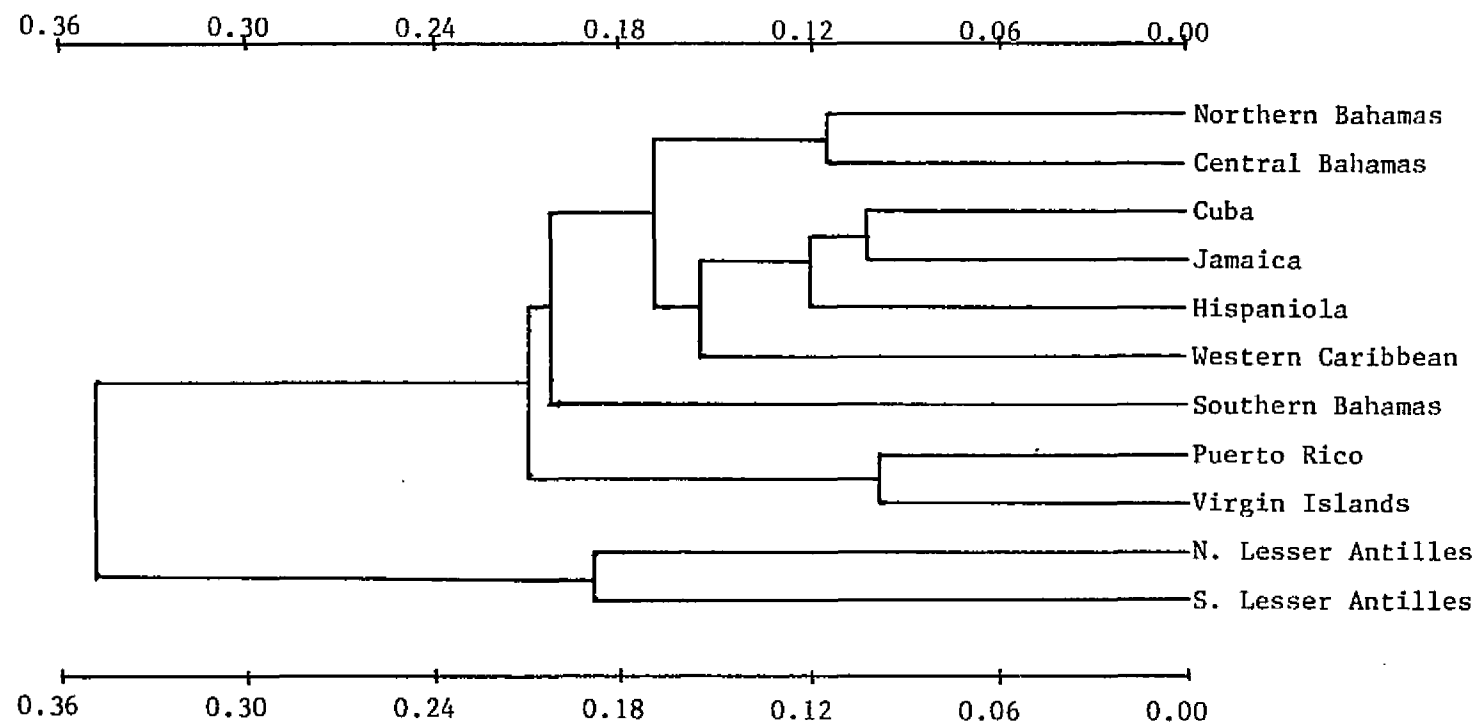


Figure 2 UPGMA tree of similarities among regions based upon wintering warbler avifaunas.

A map with concentric lines including most closely similar regions depicts the general pattern (Figure 3). The Northern Lesser Antilles and Southern Lesser Antilles are very distinct from all other regions. Within the remaining northern and western regions, Puerto Rico and the Virgin Islands form a distinctive group. Within the Bahamas, the Northern Bahamas and Central Bahamas cluster together, but the Southern Bahamas are no more similar to them than to any of the other remaining regions. The western elements of the Greater Antilles and the Western Caribbean remain tightly linked. Among these, the Western Caribbean is the most distinctive and Cuba and Jamaica are more similar to each other than to Hispaniola. These patterns are biogeographically very reasonable. The Lesser Antilles are distinctive because a number of the birds do not get that far east and south. Perhaps the most interesting feature of the tree is the position of Puerto Rico and the Virgin Islands as quite distinct from the regions to their west and north. The only outstanding anomaly in the tree is the placement of the Southern Bahamas as distinct from both the remaining Bahamas to the north and the Greater Antilles to the south.

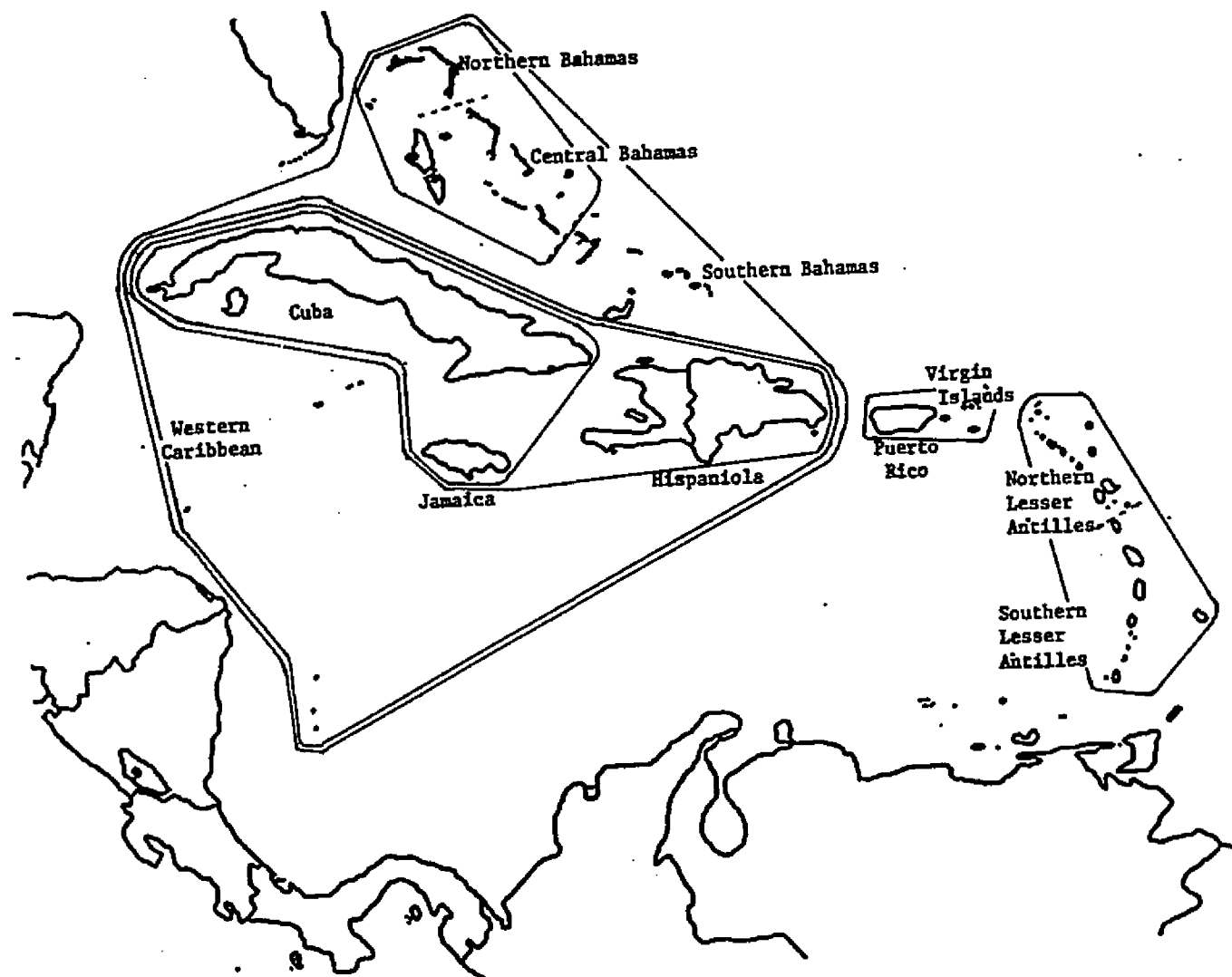


Figure 3. Degree of similarity among regions based upon Rogers distances from Figure 2. Regions greater than 0.20 units different from each other are not combined in circles.

SPECIES COMPARISONS

The frequency of each region in the overall West Indian distribution of each of the 13 species was used to try to determine which species were most similar to each other in terms of geographic distribution. Again, the frequencies were used to generate a distance matrix and a UPGMA tree (Figure 4). The distances are entirely geographic and ignore factors such as temporal distribution and habitat differences. Nonetheless, the patterns that emerge are interesting. The most distinctive species is the Black-throated Blue Warbler; this bird is only abundant on the larger islands of the Greater Antilles. The next branching separates some species that are concentrated on the northern islands like the Palm and Yellow-throated Warblers and the Common Yellowthroat from more widespread species like the Northern Parula, Black-and-white Warbler, both waterthrushes, and the American Redstart. I am unable to perceive significance in the placement of the Ovenbird, and the Yellow-rumped, Cape May, and Prairie Warblers.

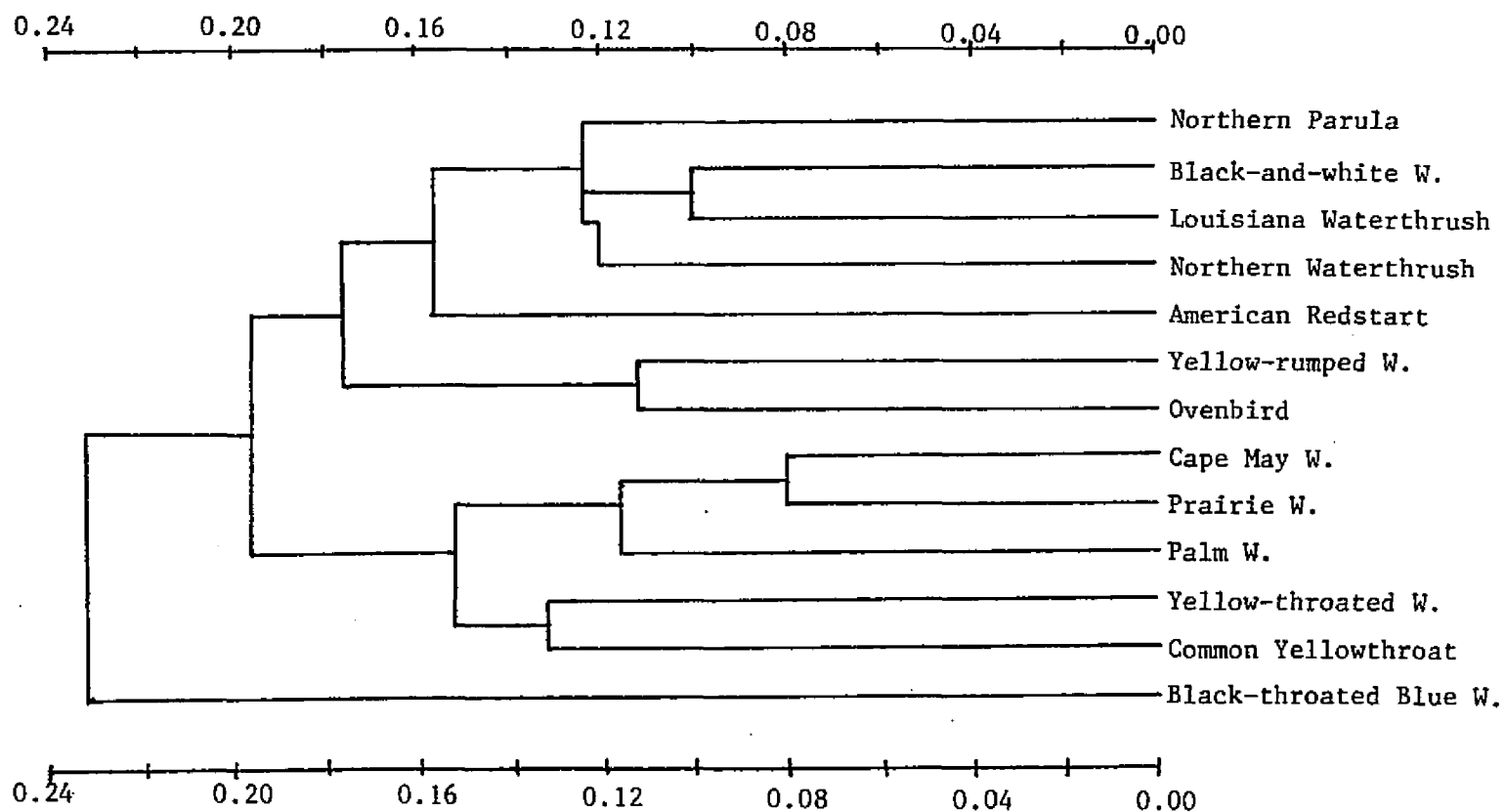


Figure 4. UPGMA tree of similarities among West Indian wintering warblers based upon regional distribution.

Temporal variation was also noted in the distribution of migrant warblers. If each month is assigned a numerical value starting with July = 1, August = 2, and so forth (following the sequence in tables 3-42), the average date of all specimens of each species and the standard deviation associated with that mean can be computed (Table 47). The lowest mean specimen date, 5.43, indicates that the mean specimen date for the Louisiana Waterthrush falls in the second week of November. This species tends to occur earlier in the West Indies in the winter season than, for the extreme example, the Common Yellowthroat that has been collected on average in late January. The smallest variance term (1.26) indicates that Yellow-rumped Warblers are found for a brief period of time in the West Indies. The Northern Waterthrush, on the other hand, is found for the longest period of time in the region based on its high standard deviation (S.D. = 3.35).

Table 47. Total number of specimens, average specimen date (with July = 1, August = 2, ... June = 12), and standard deviation among specimen dates for the 13 common West Indian wintering warblers (listed from the earliest to the latest species).

Species	No.	Ave. date	Sx
<u>Seiurus motacilla</u>	91	5.43	2.75
<u>Dendroica dominica</u>	309	5.70	2.34
<u>Dendroica discolor</u>	621	6.48	2.43
<u>Seiurus noveboracensis</u>	254	6.82	3.35
<u>Mniotilta varia</u>	258	6.87	2.40
MEAN		<u>6.97</u>	
<u>Dendroica palmarum</u>	366	7.08	1.90
<u>Seiurus aurocapillus</u>	361	7.09	2.26
<u>Setophaga ruticilla</u>	426	7.11	2.29
<u>Parula americana</u>	474	7.16	1.96
<u>Dendroica caerulescens</u>	299	7.22	1.98
<u>Dendroica tigrina</u>	459	7.47	1.84
<u>Dendroica coronata</u>	243	7.59	1.26
<u>Geothlypis trichas</u>	473	7.73	1.84

ADDITIONAL HABITAT USAGE DATA FOR SOME COMMON MIGRANTS

For parts of three winter seasons from 1983-86 I surveyed migrant warbler habitat use in the Sierra de los Tuxtlas in southern Veracruz, Mexico. I include here only those data relevant to the largely anecdotal body of knowledge concerning habitat use by the common migrant warblers of the West Indies. Available habitats in the Tuxtlas can be roughly divided into undisturbed forest, secondary growth (or perhaps more appropriately, incompletely cleared), and open pasture with scattered woody vegetation (particularly along streams). I repeatedly surveyed a total of 17 km of routes through these habitat types for migrant warblers. I report the information here as the number of individuals (of those species among the 13 common migrants of the West Indies) observed per search-hour in each habitat type (Table 48). The remaining West Indian species were either rare or absent.

The results are entirely consistent with those presented from the literature on the West Indies. I include these Mexican data because they are the only quantitative treatment of this problem of which I am aware. Notations of migrant warbler habitat in the literature from the West Indies (and virtually the entire Neotropics) are largely anecdotal.

Table 48. The number of individuals observed per search hour in three habitat types in the Tuxtlas region of southern Veracruz, Mexico.

Species	Forest	Second-growth	Open
Northern Parula	0.06	0.23	0.41
Yellow-throated Warbler	0	0.04	0.44
Black-and-white Warbler	0.33	0.39	0.15
American Redstart	0.25	0.41	0.53
Northern Waterthrush	0.02	0.12	0.58
Louisiana Waterthrush	0.27	0.03	0.03
Common Yellowthroat	0	0.11	1.69

The Northern Parula, Black-and-white Warbler, and American Redstart are generalists that are found wherever there is woody vegetation; indeed, the Parula avoids mature forest in Veracruz. I encountered Yellow-throated Warbler most frequently in palms growing in open country and the Common Yellowthroat almost entirely in low herbaceous growths and thickets of that same area. The Louisiana Waterthrush frequented flowing streams in the forested upland, whereas the Northern Waterthrush was found beside standing shallow water in the open lowlands.

SYNTHESIS OF DATA CONCERNING COMMON MIGRANTS

The following section is a summary and interpretation of information in the tables and discussion in this chapter as well as of habitat and other ecological observations in Chapters 1-9 for the 13 common West Indian migrant species. Species are treated in taxonomic order. References to expected numbers are based upon the percentage of specimens of all 13 species from a region.

Parula americana - The Northern Parula, the second most common of the migrant warblers in the region, is somewhat less common than expected in the northern and western sectors of the West Indies and reaches its peak of abundance on Puerto Rico and the Virgin Islands. Its temporal distribution is close to the average displayed by migrant warblers (Table 47). Throughout its West Indies range, its habitat has been described as wooded areas of all types. It has been noted from mangroves and coastal thickets, from dry limestone forest and damp secondary woodlands, from mangos in pastures and from mountain forests. It would seem to be a habitat generalist that requires only woody vegetation and insects.

Dendroica tigrina - The Cape May Warbler is the fourth most common of these species in the West Indies on the basis of numbers of specimens. The geographic distribution is

similar to the overall distributions of all the common migrants except are that this species is considerably more common in the southern Bahamas and are rare in the Lesser Antilles. These two factors may have caused its placement with northern species in the tree in Table 48. Mean specimen date is late in January and the standard deviation is among the lowest of these species (Table 47). This indicates that it tends to arrive late and to stay a short time relative to the other warblers. Region-wide habitat preference is ambiguous. It has been noted as common in dense vegetation of the higher mountains but rare in the lowlands of Puerto Rico; this suggests that it prefers undisturbed areas. Elsewhere, however, it has been said to use mangroves, arid mesquite, pines, and parklands with no other mention of dense native forests. Its diet is unique among these birds in that it feeds heavily on nectar and takes fruits and sap as well as insects.

Dendroica caerulescens - The center of Black-throated Blue Warbler abundance is in the Greater Antilles. This species is much more common than expected on Hispaniola and also considerably more so on Cuba. They are uncommon on all of the smaller islands of the Bahamas, Western Caribbean, and Lesser Antilles. This pattern is unique and thus this species is distinctly separated from all other species in the tree in Table 48. The temporal distribution of the Black-throated Blue Warbler is typical among the common

warbler species. There are February and October specimens and a November report of D. c. cairnsi from Cuba. A specimen of this southern Appalachian breeding subspecies was collected on Hispaniola in October, an individual was banded on Jamaica in November, and there are Bahama reports from November and April. It would seem that both cairnsi and the nominate subspecies winter in the West Indies. Habitat-related comments are not explicit as to subspecies. Black-throated Blue Warblers are noted everywhere in their winter range in dense forest, particularly in the mountainous interior of islands. Therefore, they would seem to be among the least tolerant of common West Indian migrants of disturbed situations. In Puerto Rico, the food is 75% animal and 25% plant matter.

Dendroica coronata - No obvious pattern emerges from a comparison of the geographic distribution of Yellow-rumped Warbler specimens with the null expected pattern except that this bird is essentially absent from the Lesser Antilles. Because extremely large numbers of individuals (the majority in all likelihood) winter within the United States, this species is unusual in that Neotropical data provide only a portion of the picture of wintering distribution. The median specimen date, past the middle of January, is the second latest among the common species. Furthermore, the variance term associated with specimen dates is the lowest for all species. Thus D. coronata arrives late and does not

stay long in the West Indies. In this region the abundance of this species seems to vary considerably from year to year. It has previously been shown in western Mexico (Terrill and Ohmart 1984) and Christmas Bird Counts (Pashley and Martin 1988) that this species is a facultative migrant. Single individuals of the western North American breeding subspecies D. c. auduboni have been reported from Cuba in March and from Bermuda in April. All other reports are of the nominate subspecies. This species generally avoids tall, mature forests and uses low shrubs and open, arid regions. Puerto Rican stomachs contained only insects but individual birds have been observed feeding on fruits in the Bahamas.

Dendroica dominica - The Yellow-throated Warbler is most abundant on Jamaica and Cuba and is very rare east of Hispaniola (Table 45). This is one of the earliest migrant warblers to arrive (median specimen date is in the third week of November) and it has generally departed by the end of March (Table 47). Three migrant subspecies have been reported from the West Indies. Most reports are presumably of the nominate subspecies, which breeds in the southeastern United States. There are reports from Cuba and a November and a February specimen of D. d. albilora, a subspecies that breeds in the south-central United States. A December specimen from Bahama and specimens from Cuba from November and February (not located) have been identified as D. d.

stoddardi, the subspecies that breeds largely in Florida. There is a curious dichotomy in habitat use by this species. It has been reported from Cuba, the Western Caribbean, and Puerto Rico from coastal palms, mangroves, and littoral vegetation. All reports from the Bahamas, Jamaica, and Hispaniola, however, are from pines. Pine is not present on all islands (and has been introduced on some, such as Jamaica), but I know of no island lacking palms.

Dendroica discolor - The Prairie Warbler is the most common migrant warbler in the West Indies. It is somewhat more common than expected in the Central Bahamas, less so on Hispaniola, and absent from the southern Lesser Antilles; percentages otherwise are close to expectations (Table 45). As with the Cape May Warbler, high numbers in a northern region and low in a southern region may have resulted in the placement of the Prairie with more strictly northern species in the tree in Table 48. It has an early arrival date and protracted stay in the region (Table 47). An August specimen from Cuba has been identified as D. d. paludicola as has another from October from the Virgin Islands. This subspecies breeds in the extreme southeastern United States. Prairie Warblers occur most frequently in the West Indies in dry areas with low vegetation. Thornscrub, fencerows, littoral vegetation, cultivated orchards, and mangroves have been recorded as habitat.

Dendroica palmarum - The Palm Warbler is most abundant in northern and western regions of the West Indies, particularly in the Bahamas and Cuba. It is under-represented by specimens on the remaining Greater Antilles and absent from the Lesser Antilles. The median specimen date is close to the overall average, but the standard deviation is low (Table 47); thus the stay of this species on its wintering grounds is relatively short. The western subspecies, D. p. hypochrysea, is probably best considered hypothetical in Cuba and Jamaica. It is also claimed to occur irregularly on Bermuda. The nominate subspecies displays patterns of wintering biology unique among these warblers. It is decidedly terrestrial and inhabits relatively open ground (members of the genus Seiurus are terrestrial, but the two waterthrush species occur near aquatic habitat and the Ovenbird in forests). Furthermore, Palm Warblers tend to form fairly small single-species flocks. Although the common name "Palm Warbler" may be totally inappropriate for this species' breeding biology, the birds are not infrequent on the ground below palms in the winter. If English names were to reflect true wintering habitat preferences, D. palmarum might be called the Prairie Warbler and D. dominica the Palm Warbler.

Mniotilta varia - The Black-and-white Warbler is distributed through the West Indies much as would be expected on the basis of all warbler specimens. The only region in which it

is disproportionately common is the northern Lesser Antilles. Their median specimen date is close to the median for all species; the broad distribution of specimens from August to May is reflected in the somewhat high variance. This species will use any type of wooded habitat in the region from mangroves through orchards and from second growth through natural montane forest. It apparently eats only animal matter.

Setophaga ruticilla - The American Redstart is the fifth most common of these species; it occurs throughout the West Indies but is most conspicuous as part of the avifauna of the Lesser Antilles. Although specimen dates range from July to May, the standard deviation is not noticeably high (Table 47). It uses all types of forested growth throughout the West Indies. It can be found in virtually any habitat with trees from mangroves and secondary lowland woodlands through montane rain forest. Reports, however, stress its abundance in lowland and disturbed woods (vs. less disturbed highlands).

Seiurus aurocapillus - The geographic and temporal distribution of the Ovenbird is close to "average" among wintering warblers. It is 7th out of 13 in abundance. It is a little more common than expected on Hispaniola, but occurs everywhere else close to expectations based upon total number of specimens (Table 45). Its median specimen

date is about three days later than the median for all species, and the standard deviation associated with those dates is again the 7th largest out of 13. They occur on the ground under dense canopy. Although they will use a variety of woodlands they are one of the wintering warbler species most restricted to mature forest. It has been suggested that this is one of the few of these species to show signs of winter territoriality. Several stomachs examined have contained mostly (up to 90%) plant matter (largely grass seeds).

Seiurus noveboracensis - The Northern Waterthrush winters throughout the West Indies but is much more common than expected in Puerto Rico and the smaller islands of the Virgin Islands and Lesser Antilles to the east and south of it as well as on the small islands of the Western Caribbean. It is less common than expected in the Bahamas and the Greater Antilles other than Puerto Rico. The median specimen date is close to the median for all species, but the standard deviation is by far the highest for any of these species (Table 47). It may not be true that all individuals spend a longer period of time on their wintering grounds than other species, but it is clear that at least some birds arrive early and some stay late and that the species is relatively common consistently in between. Throughout the West Indies, the Northern Waterthrush is primarily associated with mangroves. It is perhaps more

restricted to a single habitat type than any other common migrant warbler in the region. It is, however, also found to a lesser extent in some inland lowland freshwater habitats where it may overlap to some extent with the Louisiana Waterthrush. In general, it uses muddy areas whereas the Louisiana is found in rockier places. Also, the Northern tolerates somewhat drier conditions than does the Louisiana.

Seiurus motacilla - The Louisiana Waterthrush is the least common of the 13 major West Indian wintering species. The majority of individuals of this somewhat uncommon species overwinter in Mexico. It occurs in the Bahamas only as a transient but is otherwise distributed through the region much as would be expected (Table 45). It is the earliest of the migrant warblers to arrive (mean specimen date falls in mid-November) (Table 47). The fairly large number of early specimens and the paucity of specimens from September through December followed by a peak in January and February results in a large variance term. I know of no explanation for this pattern. Because so few of these birds winter in South America, it is unlikely that the early specimens represent a wave of transients. Whereas the Northern Waterthrush tends to use mangroves and sluggish lowland streams, the Louisiana occurs most commonly along upland, flowing freshwater streams. In lowlands, the Louisiana is found in rocky areas where the Northern is in muddier areas.

The Louisiana also occurs to some extent in mangroves. It has been suggested that this is one of the few territorial warblers on its wintering grounds. Indeed, this and its congener the Ovenbird are the only two species for which this characteristic has been seriously suggested in the West Indies.

Geothlypis trichas - The Common Yellowthroat is the third most common West Indian migrant warbler in terms of numbers of specimens. It is less common than expected on Hispaniola and in all regions east and south of that island (Table 45). On Cuba, Jamaica, the Western Caribbean, and throughout the Bahamas, it is considerably more common than expected. The median specimen (late January) is the latest for any of the common species. The standard deviation is also low (Table 47). In summary, this species arrives late in the northern West Indies and does not stay long. While there, it inhabits herbaceous growth and short thickets often in or adjacent to marshes and other wetlands.

MANAGEMENT CONSIDERATIONS

The 19 species for which the West Indies represent greater than 10% of the wintering range can be subdivided into five management or conservation categories on the basis of information in Table 49. Groups are listed from the most to the least threatened.

Group 1 - Vermivora bachmanii and Dendroica kirtlandii are unique in that they are extremely rare birds entirely restricted to limited ranges in the West Indies in winter. In both cases, however, the scanty evidence available suggests that their populations are limited by events on their breeding grounds.

Group 2 - Dendroica caerulescens, Helmitheros vermivorus, Limnothlypis swainsonii, and Oporornis agilis are relatively rare species that may be limited by conditions on their wintering grounds or migratory routes. The first three are dependent to some extent on undisturbed habitat and may be threatened by human activity. Oporornis agilis is rare and largely unknown off its breeding grounds; it may require terrestrial habitat in the eastern West Indies during fall migration. (The low percentage of Limnothlypis swainsonii specimens from the West Indies may be due in part to my inclusion of the Caribbean-influenced Isla de Cozumel with the mainland rather than with the Western Caribbean).

Table 49. Percentages of West Indian specimens for migrant species for which this value > 10%, overall ranked abundances among the 38 West Indian migrant warblers, and degree of habitat specialization.

Species	% Indies	Ranking	Specialized?
<u>Vermivora bachmanii</u>	100	38	?
<u>Dendroica kirtlandii</u>	100	36	?
<u>Dendroica tigrina</u>	97	20	Maybe
<u>Dendroica discolor</u>	97	12	No
<u>Dendroica caerulescens</u>	96	28	Yes
<u>Dendroica palmarum</u>	88	24	No
<u>Parula americana</u>	78	16	No
<u>Dendroica dominica</u>	68	21	No?
<u>Oporornis agilis</u>	50	37	?
<u>Dendroica striata</u>	35	22	No
<u>Setophaga ruticilla</u>	33	5	No
<u>Seiurus aurocapillus</u>	31	7	Yes
<u>Geothlypis trichas</u>	31	3	No
<u>Seiurus noveboracensis</u>	25	6	Yes
<u>Mniotilta varia</u>	22	8	No
<u>Seiurus motacilla</u>	21	25	Yes
<u>Helmitheros vermivorus</u>	17	31	Yes?
<u>Dendroica coronata</u>	14	4	No
<u>Limnothlypis swainsonii</u>	12	35	Yes?

Group 3 - Dendroica striata and Seiurus motacilla are relatively uncommon species. The former winters in South America but may depend on landfalls in the West Indies during migration. The latter has a wide winter range; however, it is a habitat specialist almost entirely associated with freshwater streams and may be limited by winter ground conditions.

Group 4 - Dendroica tigrina, D. discolor, D. palmarum, D. dominica, and Parula americana are mostly or almost entirely West Indian in wintering distribution, but are all fairly common species that can use human-disturbed habitat and thus seem not to be threatened. Dendroica tigrina could perhaps be placed in Group 3.

Group 5 - Setophaga ruticilla, Seiurus aurocapillus, Seiurus noveboracensis, Geothlypis trichas, Mniotilta varia, and Dendroica coronata are common and widespread species that are not threatened. The two Seiurus species are specialized in habitat use, but the others are generalists that can thrive in disturbed situations.

Any migrant warbler conservation efforts in the West Indies should be directed, if possible, toward species in groups 2 and 3. The most realistic and necessary management objectives, however, should be those to assist populations of imperiled warblers that are breeding residents of the West Indies (see species listed earlier in this chapter).

FUTURE NEEDS

Although I have summarized existing data on the distribution and natural history of warblers of the West Indies, there are several reasons why this remains incomplete. I still lack data from Cuban museums and need to visit those institutions in the future. Also, only a few of the migrant species are entirely limited in migration and over winter to the West Indies. Similar data sets for Mexico, Central America, and South America need to be analyzed in the near future in order to fully describe migratory zoogeography of these birds. Much remains to be learned concerning these birds. Habitat requirements in the West Indies and elsewhere on wintering grounds are poorly defined. Perhaps most critically, we are entirely ignorant of the relationship between breeding and wintering range at the deme level. We have yet to map the lifetime range of any given population or even any single migrant warbler individual, and until biotechnological advances provide this type of information, we remain incapable of making conservation decisions that insure the continued success of migratory Neotropical warblers.

LITERATURE CITED

- Lack, D. 1976. Island biology illustrated by the land birds of Jamaica. Univ. Calif. Press, Berkeley. 445 p.
- Pashley, D. N. and R. P. Martin. 1988. The contribution of Christmas Bird Counts to knowledge of the winter distribution of migratory warblers in the Neotropics. Amer. Birds 42:1164-1176.
- Rogers, J. S. 1972. Measures of genetic similarity and genetic distance. P. 145-153 in Studies in genetics VII. Univ. Texas Publ. 7213.
- Sneath, P. H. A. and R. R. Sokal. 1973. Principles of numerical taxonomy. W. H. Freeman and Co., San Francisco. 573 p.
- Terrill, S. B. and R. D. Ohmart. 1984. Facultative extension of fall migration by Yellow-rumped Warblers (Dendroica coronata). Auk 101:427-438.

VITA

David Neal Pashley was born on 6 April 1950 in Victoria, British Columbia, Canada. He moved to California and graduated from Santa Monica High School in 1968. In 1974 he graduated from Humboldt State University with a B.S. in Wildlife Management. He married Dorothy Prowell of Richmond, Texas in May 1977. David began his Ph.D. work in the School of Forestry, Wildlife, and Fisheries at Louisiana State University, Baton Rouge, in August 1982 and is presently a candidate for that degree.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: David Neal Pashley

Major Field: Wildlife and Fisheries

Title of Dissertation: A Distributional Analysis of the Warblers of the West Indies

Approved:

Robert B. Hamilton

Major Professor and Chairman

F. Allen Hambrey

Dean of the Graduate School

EXAMINING COMMITTEE:

Robert H. Chabreck

James C. Wilkani

Paul G. Burns

J. V. Remond

Date of Examination:

December 6, 1988